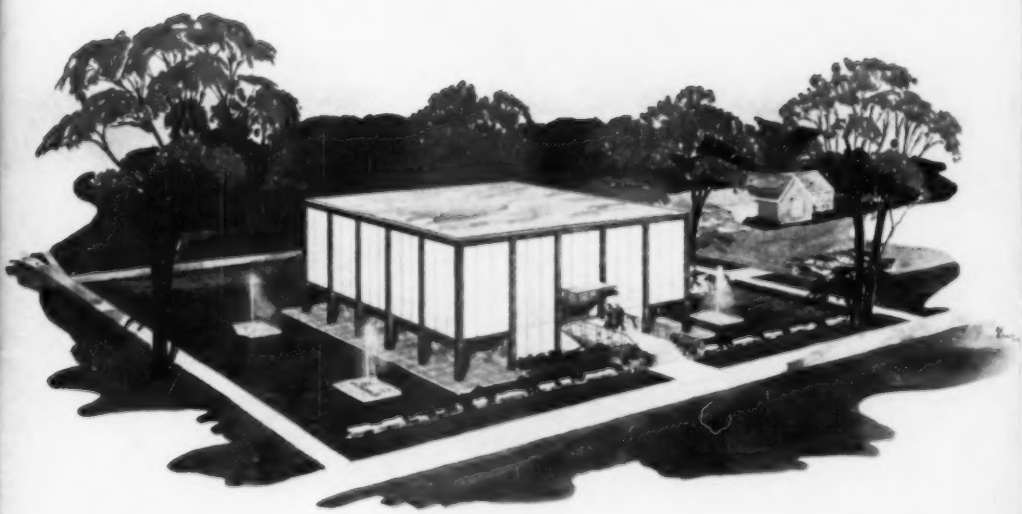
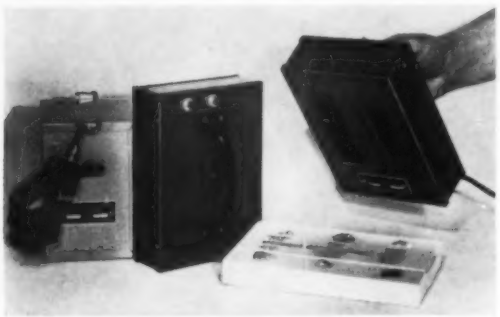
Earth Science



Tiger Eye Twin

LONG AND SHORT WAVE ULTRA-VIOLET UNIT

only **$29.75** Tiger Eye Twin model 25-36 shown with Battery Case model BA-245

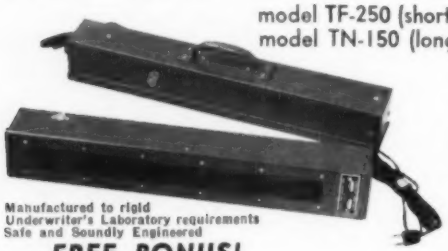


The TIGER EYE TWIN, when equipped with the Battery Adapter Case model BA-245 (optional—$5.75) and two 45 volt #202 "B" batteries (optional—$3.50 each) can be carried right into the field to give you on-the-spot information about the minerals you discover.

- Most powerful for the price . . . anywhere
- Based on the latest engineering principles
- Combines long and short wave in one unit
- Rugged all metal housing
- Extra large filters
- Comes set up, ready to use
- Easy access for replacing tubes
- Completely portable for field prospecting (with BA-245 case)
- Operates on house current or batteries
- Special circuitry for battery conservation
- Light weight . . . only 1 lb., 15 ozs.
- Compact . . . 5½"x2"x8½"
- Completely guaranteed

New TIGER EYE DISPLAY UNITS

model TF-250 (short-wave) **$58.95**
model TN-150 (long-wave) **$28.95**



Manufactured to rigid Underwriter's Laboratory requirements
Safe and Soundly Engineered

- Output: Most powerful units for the price
- Extra large filters: 1½" x 16½"
- Angle-parabolic Alzac reflectors
- Handle removable for Display Mounting
- Isolated wiring compartment, SAFE for changing tubes. (Exceptional in this price range)
- Weight only 5 lbs. Size 3" x 3" x 20"
- Completely guaranteed

FREE BONUS!

All TIGER EYE Units come with fact-filled booklet "The Unseen World Around Us," including extensive lists of fluorescent minerals, woods, etc., PLUS Six Identified Specimens of long and short wave Fluorescent Minerals.

BLE

Manufactured and guaranteed by:

BLACK LIGHT EASTERN CORPORATION
Port Washington, L.I., N.Y.
Dept. ES-10

Contact your local dealer . . . or use this handy coupon today . . .

Black Light Eastern Corporation
4 Manhasset Avenue, Port Washington, L.I., N.Y. Dept. ES-10

Please rush!

.....	Tiger Eye Twin(s) #25-36	@ $29.75 ea. .....
.....	Battery Adapter(s) #BA-245 (with carrying strap)	@ 5.75 ea. .....
.....	45 volt #202 "B" batteries (2 required)	@ 3.50 ea. .....
.....	Tiger Eye #TF-250	@ 58.95 ea. .....
.....	Tiger Eye #TN-150	@ 28.95 ea. .....
		TOTAL $ .....

Postage, insurance and handling
East of Mississippi .50—West of Mississippi $1.00
Enclose check or money order.

Name.....

Address.....

City..... State..... Zone.....

Earth Science

Volume 14
No. 4
$2.50 a Year

Official Publication of the Midwest Federation of Mineralogical Societies.

EARTH SCIENCE PRESENTS FOR AUGUST, 1961

Cover ..... Lizzadro Museum of Lapidary Arts

Here pictured is the Architect's Drawing of the Museum Building now in the process of construction in Wilder Park, Elmhurst, Illinois, which will upon completion house one of the most outstanding collections of Lapidary Art in the entire country.

Published bi-monthly at Mount Morris, Ill., by The Earth Science Publishing Company, Inc. Advertising and Circulation Offices, Box 1357, Chicago, Illinois. Editorial Office, 406 Grover Street, Joliet, Illinois. Subscription: $2.50 per year, 2 years $4.00, United States and Canada. Elsewhere $3.00 and $7.50. Advertising rates sent upon request. EARTH SCIENCE is receptive to articles of Earth Science interest. Manuscripts, photographs, sketches will not be returned unless accompanied by ample first-class postage. Permission to quote or reprint articles from this magazine will be considered upon written request. Communications for editorial consideration should be sent to Ben Hur Wilson, 406 Grover St., Joliet, Illinois. The Earth Science Publishing Company makes every effort to select its articles and advertising carefully in order to merit the confidence of our readers, but assumes no responsibility for the statements and opinions expressed by contributors and/or advertisers in the magazine.

Formerly
Earth Science Digest

CHANGE OF ADDRESS

Subscribers should notify their Postmaster, and the Earth Science Subscription Department at least thirty days before change is to take place. Both old and new address should be given to assure promptness and accuracy. Postmaster: Send Form 3579 to P.O. Box 1357, Chicago, Illinois.

Published Bi-monthly: February, April, June, August, October, December

Second Class Postage Paid at Mt. Morris, Illinois

Editor's Memo Pad

ANNOUNCEMENT

IN this issue of EARTH SCIENCE we are very happy to be able to announce the establishment of the Lizzadro Museum of Lapidary Arts which is to be located in Wilder Park in the city of Elmhurst, Illinois through the generosity of Joseph F. Lizzadro of that city, who has for many years been an ardent enthusiast in this branch of our wonderful hobby.

This fine building, unique in the history of our hobby, will be adequately endowed, and will serve not only as a museum show-place for lapidary art, but also as a work place where lapidary classes will be conducted for those who may be interested. It will in fact soon become a very worthwhile educational institution.

Along with many other displays of minerals and polished materials it will house much of the magnificent collection of art gemstone material of the Lizzadro family as well.

REGRETS

EARTH SCIENCE regrets greatly that we are unable to publish any of the details concerning the great "Midwest" convention and show held in Saginaw, Michigan under the auspices of the Tri-County Rocks and Minerals Society, June 29th to July 2nd, in this issue of the magazine. Our publication date lines prevent our so doing. Be assured that in our following issue (October) we will report on the convention. Watch for our story.

A REMARKABLE FIND!

Looking ahead to the big 1962 "Midwest-American Federation" show to be held in Des Moines next summer, the question may arise in many of your minds,—"Now what is there to be seen of interest to our hobby in this great prairie state where the tall corn grows?" This is in fact a good question, and in our succeeding issues we shall attempt to inform you of some of the most interesting places to visit and what may be seen in the area, for the benefit of those who may already be planning to attend this great show and convention.

In the first place, few people realize, and most will be surprised to learn, that of all of the states in the union, Iowa is unsurpassed in the number of its fine fossil collecting areas and the excellent quality of its invertebrate fossils of the Paleozoic Era.

Only this summer, in an old strip-mining area near Pella (Iowa), a new site has been discovered which paleontological experts from a number of large universities say may prove to be the greatest find of the century. Students from Central College nearby are now excavating and, we are pleased to say, carefully preserving what may possibly prove to be the largest and most complete fossilized remains of carboniferous plant life known to exist anywhere. Complete tree-like ferns have been found in a perfect state of preservation measuring up to 120 feet in length.

And too, a considerable amount of animal life fossils have been found, also in an excellent state of preservation. Pella is not far distant from Des Moines, and may easily be visited by those attending the convention next summer. In succeeding issues we shall likewise describe other points of interest.

Recent Find of Agate in Missouri

We are indebted to Mrs. Gladys Coil, Bulletin Editor of the Independence, Missouri Gem and Mineral Club, for news that a new material believed to be agate has been found near El Dorado Springs in a small creek bed. To investigate this find, follow Route 82 one mile north and five miles east of El Dorado Springs until just before it crosses into St. Clair County. At this point, instead of turning with Route 82, continue in a straight direction down a dirt road until one comes to a very small bridge. At this point, accord-

ing to the map, the creek is only two miles from its source. In this creek is the agate. Mrs. Coil was good enough to send us two slabs of the material, one of which is mottled with red, which may be due to the presence of iron.

Letters of Interest

Adventures in Jade

FROM the American Baptist Assembly we have good news concerning the possibility that our readers may yet secure a copy of a rare book on the subject of jade which may very soon be out of print.

Dear Earth Science Editor:

It is entirely permissible with us to have you pass on information concerning Adventures in Jade by James Kraft to other clubs. We, of course, are happy to provide this book for any clubs who may be interested.

Interested clubs may obtain copies in case lots of 40 by ordering at the rate of $1.25 per copy, express charges added, attention of:

Mr. Wesley C. Hodges, Director of Conference Services
The American Baptist Assembly
Green Lake, Wisconsin

Ed. Note: This, fellow club members, is a real bargain, as these books are first edition copies which originally sold when published in 1947 for $3.50 each.

We Were In Error

From Mabel Sterns of Redlands, California, editor of **"Shells and their Neighbors,"** we also have received an interesting letter informing us that we were somewhat in error when we stated in our June issue that "Conchology Was Once a Popular Hobby," and what we really should have said is "Malacology and Conchology are NOW VERY POPULAR HOBBIES.

To Earth Science:

Several books and other publications which are available in most public libraries mention 31 or more malacological and conchological clubs in the United States, and 19 in foreign countries. Some of the former have been active for many years, but the number organized since the beginning of 1960 clearly indicates the surge of interest in shells. The number of members in each ranges from a dozen to several hundred; frequency of meetings varies from once or more a month, to annually on a national scale.

Shell exhibits in Florida almost overlap in dates. Those in other areas are less frequent, but are increasing every year. It is no longer unusual to hear of categories for shells in gem and mineral shows. Fossil shells have been shown for some time, of course, under the classification of "Fossils."

A number of clubs publish bulletins (some on a subscription basis) that include illustrations and technical papers. Our own shelletter is an independent publication that shows how shells are related to industry, health, food, handicraft, religion, architecture, archeology, and other aspects of our lives.

Clubs are not confined to coastal states, by the way. St. Louis, for example, is the home of an inland group.

Notice that every rockhound has a few shells around the house! We predict that in order to catch up with the times, EARTH SCIENCE will broaden its policy again and include shells.

Sincerely,
Mabel Sterns

RECOMMENDED READINGS

"How to Photograph Rocks and Minerals," by Mrs. Loren Root. June issue of *Pick & Dop Stick*. Contains helpful information on equipment, types of films, arrangement of specimens, and how to emphasize the interesting characteristics of a particular specimen.

"My Method of Making Spheres," by Ralph McClung. May issue of *Conglomerate*. Concise and clear instructions on how to make lovely polished spheres from gem stone materials.

"Mineral Names Interesting," by Lucille Goodyear. May issue of *Rock Lore*. Tells how 25 different minerals were named. For example: Because the garnet was a small red stone resembling pomegranate seeds, the Latins called it "garnu" which was their word for seed.

"How to Learn Correct Mineral Names," by June Culp Zeitner. June issue of *Mesabi Media*. Many rockhounds, Mrs. Zeitner writes, have the negligent habit of calling rocks and minerals by nicknames, local names and incorrect names. She lists excellent tips on how to learn the correct names of minerals.

Rip Rap

Have you added "I.Q.S.Y." to your vocabulary yet? The year 1964-1965 will be known in scientific circles as the International Year of the Quiet Sun. Research in this 18-month period, when spots on the sun will be at a minimum (compared with maximum solar activity during I.G.Y.), will concentrate on a world-wide survey of the earth's magnetic field. This field is conceived as projected by a bar magnet about one-third of the earth's diameter in length, lying near the earth's center and tilted about 20° from its spin axis. Concentrations of magnetic ore near the surface create disturbances in the general magnetic pattern.

Among the effective instruments for detecting these disturbances is the magnetometer. Attached to an airplane, it is particularly valuable for surveys of areas inaccessible other than by air. The heart of the magnetometer is a system of three flux-gates which supplies a continuous record of magnetic intensity along the line of flight. Flattened curves on the record graph indicate the presence of non-magnetic sedimentary rock, which diminishes the intensity of the variations of underlying igneous and metamorphic strata.

Rings on your fingers? An ordinance was passed limiting the allowable number to two. No woman might use more than twelve bars of silver in her belt nor wear her dresses longer than two ells at the back. No man could ornament himself with silver. Brooches of precious stones with divers emblems and letters were forbidden. But that was back in the year 1330, in the Italian city of Florence. Today we may freely use the products of lapidary art for personal adornment subject only to the restraints of good taste.

Investigations by the South Australian Museum and the University of Adelaide confirm the fact that fossil specimens found in Australia are pre-Cambrian. The fossils are traces of jelly-like animals without shells or hard skeletons. They are believed to have come to rest on patches of fine clay later covered by sand. The sand grains were cemented by silica solutions and changed to quartzite. The clay was converted to the mineral sericite. The fossils were revealed by weathering away of the ancient rocks at the junction of quartzite and sericite.

Our Authors

Hobby and Rehabilitation

Too much praise cannot be given the three authors, Dr. John K. Uchiyama, on the staff of the Iowa Methodist Hospital; Dr. Charlotte Fisk, on the Children Pediatric Staff of the Raymond Blank Memorial Hospital; and Dr. William deGravelles, Chief of the Physical Medicine and Rehabilitation Service, of Yonkers Rehabilitation Center, all of Des Moines, Iowa, for their splendid cooperative effort in this most worthwhile common interest, and to the Des Moines Lapidary Society under whose direction the publication of the brochure containing this compilation was made possible. B.H.W.

All That Glitters is Gold

Mr. M. A. Fillmore has created other jeweled art pieces not pictured, notably an original creation "The Holy Spirit Descending on Earth through Tongues of Fire." All of his models are for sale. Many have been exhibited at gem shows. He shows them privately by appointment, and welcomes correspondence from interested persons. The Travel Study will be shown at the Harry E. Lewis booth at the American-Eastern Federation show in Miami August 10-13. Mr. Fillmore's address is 6631 S.W. 64th Ave., Miami 43, Florida.

Important Coming Events—1961

FEDERATION SHOWS

Aug. 10, 11, 12, 13. American Federation of Mineralogical Societies and **Eastern Federation of Mineralogical** and **Lapidary Societies.** Combined Convention and Show, Municipal Auditorium, Miami, Fla. **Gemcrafters of Miami,** host.

Aug. 31 thru Sept. 4. Northwest Federation of Mineralogical Societies. 21st Annual Gem and Mineral Show in conjunction with the Southeastern Washington Fair and Rodeo, Exposition Building, Walla Walla, Wash. **Horseheaven Gem and Mineral Societies,** host.

Arthur L. Flagg Memorial Tribute

A Tribute to a Great Man

"HE alone is worthy of the appellation who either does great things, or teaches how they may be done, or describes them with a suitable majesty when they have been done; but those only are great things which tend to render life more happy, which increase the innocent enjoyments and comforts of existence, or which pave the way to a state of future bliss more permanent and more pure."
—John Milton

There truly is no death for him whose life
Has ever touched the lives of other men
With fingers sowing seeds of knowledge or of joy
Which grow to spread and then to grow again.

He lives forever through his myriad friends
Who cherish in their hearts his memory;
And deeds of kindness and his fruits of work
Are stamped upon the earth for all eternity.

Just as the ripples ever wider grow,
Reflect and multiply from every shore—
A single pebble cast is like a life
Upon the sea of men forevermore.

Arthur L. Flagg (Mr. Rockhound) passed away in Phoenix, Arizona on April 27th. He is survived by his widow, Mary, his sons Edward of Phoenix, Arizona and Richard of Denver, Colorado, and his daughter Anne, Mrs. Leonard Hines of Tucson, Arizona. His friends and acquaintances, though grieved by his death are left richer for having known him; all others sustain an unknown loss for having missed the benefit of his presence.

—BIOGRAPHICAL SKETCH—

As a young mining engineer, Arthur Flagg followed Horace Greeley's advice and came west. He worked at assaying, surveying, and mining in Yavapai County, Arizona during 1906 and 1907. From 1908 to 1912 he held a position as mine examiner in Durango, Mexico.

In 1910 Arthur L. Flagg was married to Mary Harkness White and thus began a union which was to flourish for over 50 years. They were blessed with two sons: Edward Carlton and Richard Welford, as well as a daughter: Anne Bailey. In later years he was to take great pride in his nine grandchildren.

1912 found Arthur Flagg in private practice as consultant engineer in the states of Washington and Idaho. In 1913 he became manager of the Kelvin Sultana Copper Company which position he held until taking over as Receiver of the company in 1916. He resumed his private practice in Arizona in 1919. He has also held the position of director of the Ace Mineral and Development Company, consulting engineer of the Gallagher Vanadium and Rare Mineral Corporation, and Vice-President of the Mines Holding Company.

Mr. Flagg took over as superintendent of the Mineral Department of the Arizona

State Fair in 1946. In 1949 he became connected with the State Department of Mineral Resources. Upon reaching the age of retirement (70) in 1953, the mining companies combined to keep him in the position of curator of the mineral museum as he could no longer be employed by the state.

He contributed as a member to many organizations the first of which was the Sigma Chi fraternity to which he belonged in his college days. He was a member of Sigma Xi; (F) American Association for the Advancement of Science; the American Institute of Mining Engineers; the Arizona Academy of Sciences; the American Institute of Mining, Metallurgical and Petroleum Engineers, Arizona Small Mine Operators, and the Heard Museum Board. He was a licensed Mining Engineer for the State of Arizona.

In 1948 he served as president of the A.A.A.S. He was also president of the Mineralogical Society of Arizona, the Rocky Mountain Federation of Mineralogical Societies and the American Federation of Mineralogical Societies. He was co-founder of the Arizona Society and the Rocky Mountain Federation.

Mr. Flagg was the author of many valuable contributions to mineral and mining publications. He has had two books published: "Rockhounds and Arizona Minerals" and "Mineralogical Journeys in Arizona."

In 1960 as part of the celebration of the 75th Anniversary of the State of Arizona Mr. Flagg was awarded a special medallion with the citation: "Graduate of Brown University with the degree of Bachelor of Arts in 1906; registered mining engineer and curator of the Arizona State Mineral Museum; author of "Mineralogical Journeys in Arizona," recognized as a national authority by gem and mineral societies; enthusiastic sponsor of Rock Hound Clubs and other groups, who has stimulated interest in the natural wonders of Arizona on the part of both young and old; distinguished geologist and mineralogist who has contributed much to his community and to the state, Arthur L. Flagg."

Mr. Flagg has also been honored by having been selected as worthy of appearing in "American Men of Science" and "Who's Who in Engineering."

During July of 1960 he suffered a severe heart attack which forced him to retire from the active functions of his office. However, to the last he maintained an interest and contributed as much as was physically possible.

At 5:30 on April 27th he died quietly in the Good Samaritan Hospital where he had been since the 2nd of March. The cause of death was heart disease combined with arteriosclerosis.

As a young boy Arthur Flagg was tremendously impressed by a teacher who seemed to have limitless information concerning the natural sciences. Not only was he inspired to work toward a career in the field of geology, but he spent the rest of his life emulating the kindness of the man of science who took the time to encourage a small boy. His love and understanding of nature was surpassed only by his feeling for children of all ages.

In the field of mineralogy he fostered many societies for amateur "Rockhounds" always stressing the importance of including children in their program of adventure through the field of minerals, gems, and rocks. The A. L. Flagg Trophy was set up to encourage young people to exhibit their findings at the Arizona State Fair. Mr. Flagg also worked closely with the public schools, presenting programs for the pupils and enlightening the teachers on the possibilities in the earth sciences.

Fascinated by the western part of the United States after his first trip to Arizona, he made a career of exploring the many natural facets exposed in the Baby State. He is said to have known personally more about the area of Arizona than any other individual. Much of this information he has made available to others through his books and his articles in such publications as Arizona Highways Magazine.

Several years ago a six year old boy gave a talk before the Mineralogical Society of Arizona on the occasion of their annual Junior Program. His speech was entitled, "How to Start a Rock Collection." In its entirety the contents were: "First you find a cigar box. Then you put in some cardboard dividers. Then you go pick up some rocks—anywhere. Then you ask Mr. Flagg what they are."

This simple revelation expresses the faith held not only by children but by all persons who came in contact with Mr. Rockhound. It was a faith not only in his knowledge but in his kindly understanding of people. To those same children their one consolation is that now St. Peter can:

"ASK MR. FLAGG."

Courtesy of Mineralogical Society of Arizona

Midwest Federation of Mineralogical & Geological Societies

MID WEST FEDERATION

OFFICERS 1961-62

Leo Yanusak	President
Catherine Steinbrenner	Secretary
Wm. H. de Neui	Treasurer
Ben Hur Wilson	Historian-Custodian
Richard N. Lake	Membership Chairman
Russell Kemp	Rockrama Director
Bernice Rexin	Vice President

Regional Vice Presidents

Verne Montgomery	Central
M. R. Gingery	Eastern
Bernard Dooley	Northern
R. E. Brush	So. Western

ATTENTION: ALL ROCK HOUNDS AND MINERALOGICAL SOCIETIES who have not as yet affiliated with the MIDWEST FEDERATION.

IN UNION THERE IS STRENGTH

Through affiliation with the Midwest comes the opportunity to participate in our Annual Conventions, Rockramas, bulletin exchange programs, and receive information from our committees on each branch of the Earth Sciences.

It is not essential that one belong to a club in order to be eligible to join the Midwest Federation.

You will be very welcome and you will find the advantages to be gained far exceed the slight cost and effort expended.

The Midwest now comprises more than 100 clubs and many individuals, and is a branch of the larger American Federation which comprises the regional Federations of the U. S. and Canada.

For further details, contact Richard N. Lake, P.O. Box 361, Chisholm, Minnesota.

EARTH SCIENCE, *Official Magazine*

P.O. BOX 1357, CHICAGO 90, ILLINOIS

Earth Science

Vol. 14
No. 4

August, 1961

Planning the Lizzadro Museum of Lapidary Arts

By JOSEPH LIZZADRO

I HAVE found that establishing a museum is not a simple matter. The present concept of the museum has evolved through many phases.

Collecting has been a long and pleasant task which I have been doing for over thirty years, during the past fifteen of which the goal of a museum has been constantly in mind. This has been a family affair in which my wife, my two sons, Joseph and John, and my four daughters, Angela, Diana, Bonita and little Teresa, have participated in field trips, have helped with catologuing and many other details, and have looked forward as enthusiastically as I have to establishing a museum.

At first we planned to convert our Elmhurst home into a museum. This idea was later abandoned in favor of a new building designed expressly for the purpose. The site was a matter of study for some time, but was solved by the Elmhurst Park District granting space in the southeast corner of Wilder Park.

The building will have 8400 square feet of floor space. The exterior will be of a white quartzite material with vertical columns and corner trim of dark blue granite. The main entrance on the north side of the building will lead to the museum proper on the upper floor elevated a few steps above ground level. The office will also be

Dr. Ben Hur Wilson Addresses Guests at Groundbreaking Ceremony in Wilder Park, Elmhurst, Illinois May 21, 1961

Morgan Smith (left), President of Elmhurst Park District, and Teresa Lizzadro Lend a Hand to Museum Founder. (Courtesy Press Publications)

located on this floor. Plans for the interior, including arrangement of display cases, lighting, etc., are still incomplete. Entrances to the lower floor will be on the south and west sides of the building about 4 feet below ground level. This floor will have a meeting room for club and lecture use, a smaller room for Directors' meetings, a lapidary workshop, and cases for displays of area club work and collections.

The building will have no windows and will be completely air-conditioned.

The museum is a non-profit corporation. At present, the officers are my wife, Mary, and myself. Shortly, a full complement of Directors from the Greater Chicago area will be appointed who will be the governing body

Bonita Lizzadro Studies Jade Carvings Destined for Museum.

and direct the operation of the museum. The Board of Directors will employ a qualified curator and provide instructors for teaching lapidary and silver work.

Closed circuit television will be used for instruction, lecturing, and to oversee the floors at all times.

On the outside of the building along the arcade walk, we plan to have an exhibit of stones and minerals such as petrified wood, jasper, agate, copper, and other specimens. The arcade can also be used for special shows or displays.

Of the many items of oriental jade and hard stone carving which will be the center of the museum, a 10-panel screen made of jade and other hard stones set in a cinnabar background of different bird scenes will occupy a permanent place.

My collection will need considerable filling in, particularly in the gem and crystal field. To accomplish this, we will do a great deal of traveling in this country and abroad to acquire the needed material.

I am grateful to all who have assisted in contributing time and money.

Any suggestions will be appreciated. Please write to Lizzadro Museum of Lapidary Arts, Wilder Park, Elmhurst, Illinois.

The museum is expected to be completed in June 1962. It is my earnest hope that the people of Elmhurst and our neighboring communities will visit it often and avail themselves of its facilities. My purpose, and that of my family, in building and endowing the museum is to share with others our enjoyment of the eternal beauty in gemstones and our appreciation of the art with which man has complemented the work of nature.

The Lizzadro Museum of Lapidary Arts

Remarks at Ground Breaking Ceremony

By DR. BEN HUR WILSON

LOOKING back across the years all of us can think of many memorable and significant occasions which stand out as high lights among our personal experiences. However, I am quite certain that few of them can be more outstanding or important than the event we have just witnessed here this afternoon.

As representative of the Midwest Federation of Mineralogical and Geological Societies, and also of the overall American Federation, I consider it not only a great pleasure but also a great honor and distinction to be here on this occasion and privileged to have some small part in it.

I shall speak only briefly upon my own personal impressions concerning the importance and significance of this event, not only to the community of Elmhurst and its surrounding areas, but to the nation and the world. Its impact on our cultural well-being will be felt for many, many years, perhaps even centuries, to come.

There may be many among us who have the growing feeling that we are now living in an age and a period when much of our cultural heritage is being sorely neglected, in fact being rapidly pushed aside or relegated to an inferior position, out of all proportion to its real value as an educational and stabilizing influence in the everyday life of our modern civilization.

There can be no doubt that except in a relatively few local points of concentration, such as in our great museums, art galleries, and centers of higher education, great music, great art, the opera, and other wholesome cultural influences now stand proportionately at their lowest ebb in any period of modern history.

It is indeed heartening and refreshing, then, when we occasionally find here and there an apparent reversal of this trend, where a new oasis springs up in our so-called cultural desert. It is just such a thing, my friends, that is coming into being here in Elmhurst within the next twelve months.

In the past many men of unusual vision and foresight have endowed certain foundations and thus brought into being cultural and scientific institutions which have been a blessing and of lasting benefit to mankind everywhere. We need only mention the great Smithsonian Institute at Washington, D.C., the Franklin Institute of Philadelphia, and the Field Museum, now the Chicago Museum of Natural History, by way of illustration.

It is indeed fortunate that we have here in Elmhurst just such a man in the person of Joseph Lizzadro, whom so many of us through the years have come to know and to admire very much. Forthright and modest, without any show of ostentation, he has

come to know and to love great gem art, particularly in the form of carved and polished gem material, which is the most enduring form of art known to man. Such ancient art is priceless in value and wholly irreplaceable. Much of it could never again be reproduced anywhere upon the earth, as such artisans as first brought it into being no longer exist today.

Now, this great collection of art gem material, coming as it does from the four corners of the Earth, might well be likened to a mighty river whose many branches are channeled into one great single trunk stream carrying them on to the sea. Figuratively now, this great collection of gem art, like the river, will eventually flow into the cases of the Lizzadro Museum of Lapidary Arts, where it will remain, barring unforeseen catastrophies, for many long years, perhaps even centuries. Here it will interest, inspire and edify all those who visit it, and naturally it will be of the greatest benefit to those who live close at hand. Those of the great city of Chicago, and particularly those residing in the many neighboring cities and suburban areas, will forever be indebted to the donor for establishing this great institution in their midst.

We know that the citizens of Elmhurst are deeply appreciative, and will cooperate splendidly with the management in making this a fine cultural center, one which will be of the greatest benefit to many generations of art lovers yet to come.

LAPIDARY ART—
Hobby and Rehabilitation

By Dr. John K. Uchiyama, Dr. Charlotte Fisk, and Dr. William deGravelles

THE LAPIDARY ART is one of the many hobbies used to foster and cultivate the "inner man" to his ultimate satisfaction and pleasure and involves a unique combination of manual and aesthetic expression. It is a thrilling and fascinating activity, offering great freedom in designing and processing.

IN REHABILITATIVE MEDICINE the Lapidary Art creates a psychological impact in that it restores a sense of accomplishment and self-respect during periods of engrossment and submerged self-pity, anxiety and self-concern. The Lapidary Art challenges innate artistic and creative abilities of a man to his utmost capacity. Thereby, self-expression with individualism and personality becomes apparent in the product of his creation. There is nothing more satisfying to an individual than to sense this relationship.

LAPIDARY WORK is being used in hospital occupational therapy departments as a medically prescribed activity to benefit physical, mental, or emotional conditions. It is both a manual and creative activity.

In the area of physical medicine and rehabilitation, this activity can be adapted for use in developing fine finger and hand coordination, increasing strength and range of motion, and relieving tension. It can be carried out from standing position, wheelchair, or even by a person confined to bed. For many people the interest is high in pursuing gem cutting as an avocation. It can be enjoyed by a person able to acquire a few simple machines and tools, and a modest collection of gems. In the area of prevocational exploration, a person's ability can be tested in precision work, exactness, powers of concentration, and organizational ability. In some instances, this work can assist in developing skills for a chosen field.

Persons using this selected activity generally are highly motivated, see satisfying results, and often can become a skilled artisan.

TECHNICALLY THE LAPIDARY ART essentially includes the process of cutting and polishing gem stones for jewelry or other ornamental purposes. It may be geometrical as in faceted gemstones or free hand designed, as in cabochons or baroques, which are affixed to a suitable mounting, completing the jewelry and producing esthetic and artistic expression of the creator.

OTHER ALLIED INTERESTS of the Lapidary Art include collection of mineral specimens, either through purchase or laborious, but fruitful and very satisfying field trips.

PALEONTOLOGY, although not a Lapidary Art, is closely akin because in search of gemstones and minerals very frequently fossils of prehistoric animals and plants are found.

MECHANICAL PROCESS OF CUTTING and POLISHING GEM STONES

SLABBING OF GEM STONE

SLABBING is the initial process which enables one to appreciate and later select a design or intricate natural pattern for specimen or jewelry. This process is accomplished by the use of a diamond saw.

TEMPLATING OR SELECTION OF A DESIGN

Standard templates conforming in dimension and contour to mountings are available. With the aid of aluminum or bronze pencil a suitable design is selected and drawn conforming to the outline of the template. Metal pencils are used as graphite are not satisfactory in oil.

TRIMMING THE DESIGN
With the "Trim" Saw

The selected design on the slab is then isolated closely to the mark by a smaller diamond saw. Trimming is usually accomplished by free hand method; whereas the slabbing is done by securing the stone rigidly in a vise.

DOPPING THE STONE

The pencilled outline surface is used as the guide for the subsequent process. The stone is heated gently and only sufficiently to permit good adherence of stone to a "handle" or "dop stick".

GRINDING

The dopped stone is ground on a special carborundum abrasive under water as a coolant. The grinding process roughly preforms the gem stone.

SANDING

After the grinding process the dopped stone is cleansed of coarse grits and debris and dried. It is then further fashioned to a closer tolerance by abrasion on belt or disc with a resilient backing which is necessary to obtain the curved surface on the cabochon.

POLISHING

A suspension of cerium or tin oxide, or other finely divided abrasive material is applied to revolving wheel of leather or other resilient material and pressure is applied until the abrasive marks are no longer visible and highly polished stone is obtained.

MOUNTING THE GEM STONE

The dopped stone is removed by carefully heating the sealing wax until soft and slipping off the "handle". The wax may be removed more completely with solvents such as acetone, or commercial laquer remover. The stone is then placed in a previously selected mounting and secured by various means, bezels, prongs, and cement, thereby completing the process.

It may be added that looking over a "rockhound's" shoulder is worth more than all the reading that may be done. Visiting and joining your local rock and mineral clubs would be very helpful in furthering one's interest.

Editorial Comment:—In publishing the above article in this issue of EARTH SCIENCE we feel that we may be introducing what may become one of the greatest strides forward yet made by our hobby as a positive contribution to the well-being of many thousands of individuals now existing in the doldrums of a somewhat monotonous living experience.

KONA DOLOMITE—How It Got That Way!

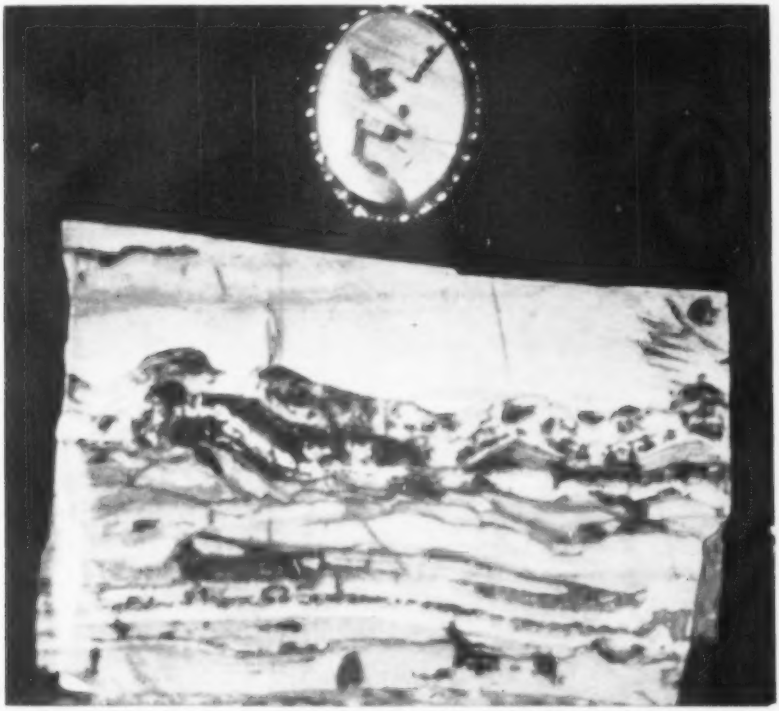
Perhaps the World's Oldest Fossil Remains

By WILLIAM D. KELLY

SHORTLY following World War II, many people were learning about atomic energy, and the phenomenon of atomic fission. An intensive search was being made almost everywhere for radioactive ores of Uranium and Thorium. In July 1955, with my favorite geologist friend, Wylma, we were searching the many mine dumps of the North Range Iron Mining Company, at Beacon Hill, Michigan, with a small Geiger-Muller Counter. Here we found a piece of radioactive ore.

The Atomic Energy Commission had previously opened an office in Ishpeming, Michigan. Dr. Virgil Mann was the geologist in charge of this district office. We took our find directly to Dr. Mann who ran some tests on the specimen and classified it as Samarskite, an ore of uranium. Dr. Mann went out into the field with us, but no more Samarskite was found. In the course of our conversation with Dr. Mann, he told us of the occurrence of Kona Dolomite on the face of a cliff east of the State Prison facing Lake Superior near Marquette, Michigan. We found the Kona Dolomite, and it has been of greatest interest to us ever since.

It is probably one of the oldest fossils you will ever come in contact with, coming as it does from a member of the lower Huronian Period. An equivalent horizon in Dickinson County,



Kona Dolomite specimen showing Mountainous Scenic Pattern quite typical of the mineral. Faint outlines of algae fossil may be seen with careful observation. Pendant of the same material. Photo by Robert Markert.

Michigan north of Felch, is called Randville Dolomite. Kona Dolomite takes its name first from the Kona Hills, the place name of the location, and from Dolomite, $Ca.Mg\ (CO_3)_2$, it being the by-product of the natural dolomitic process.

Here we have the key to the process that preserved the ancient algae in fossil form, for us to admire and love, not only for the beauty of its structure, but likewise for its many striking colors. The cellular structure of the algae itself is not often readily distinguishable.

In the process of dolomitization, living forms of animal and vegetable life that flourished in the ancient seas sometimes became embedded or surrounded by calcium carbonate precipitate, a soft white limy muck. Gradually the magnesium in solution in the sea water proceeded to replace some of the calcium, atom by atom, to form a calcium-magnesium carbonate, now dolomite, which later becomes indurated into hard rock structure, usually dolomitic limestone. The proportion of magnesium to calcium may be less than 50%, and in such case the physical properties of the matrix that holds the fossils are affected. Silica and other elements or minerals may also later enter into the combination, and especially iron and manganese may combine to bring color into the picture.

The planet Earth was old in early Huronian Time. There was land and sea and atmosphere. There was abundant calcium, magnesium, oxygen, as well as nitrogen, carbon and carbon dioxide in the seas that existed in what is now the Lake Superior region, as well as large areas of what is now Canada. Authorities say that this was nearly two billion years ago, at least that is the best estimate that is derived from the "clocks" that tick on the radioactivity of such elements as potassium degenerating to argon; rubidium to strontium; uranium and thorium to lead, and so on.

In the seas of the lower Huronian period there grew primitive plants in great masses. Algae is a word from the Greek meaning sea weed. I am grateful to Dr. Eugene Richardson, Jr., curator of fossil invertebrates at the Chicago Natural History Museum, for the following information on these primitive plants. "Plants such as the blue-green algae (Myxophyceae) which had the property of depositing limy gelatinous sheaths surrounding the individual filaments of the colonial structure of cells, making up the blue-green algae plant." Dr. Richardson also states that fine clastic or aggregated colloidal particles, entrapped in the mesh of the filaments then rise above the sheath, to form a sediment in the shape of the algae colony. The accumulation of this sediment is purely mechanical; it is not due to the algal metabolism. The shape of this accumulation of sediments indicates the shape and size of the algae colonies. The name now given to these structures is Stromatolites (Strom-o-toe-lites) are preferable to the older term Calcareous Algae. There were probably other plants as well as Myxophyceae (mik-so-fis-e), that had these properties. Stromatolites have been found in many parts of the world and were formed in many geological periods of time, from the earliest Algonkian on up to the present. Much of the world's mineral wealth now occurring in the sedimentary rocks was laid down in these ancient seas, later to become concentrated and elevated by geologic deformation, and thus made available for the use of modern man.

In the case above, of the plants from which the Stromatolites took their form, whether the blue-green algae, or some other form of plant life, there was this sheath of limy gelatinous material surrounding the filaments of the plant. This limy sheath also combined with magnesium from the sea water to help complete the preservation of the fossil plant by the same dolomitic process.

Vulcanism followed the period of these sedimentary deposits of Huronian age displacing the Kona Dolomite and leaving the strata upended.

(*Continued on page* 165)

Geometric Figures Used In Lapidary

By DORIS KEMP

HAVE you ever cut a stone in a shape with several or many sides, then tried to figure out what it is called? Consult your dictionary for a drawing or illustration of the figures listed below. First, a few definitions will help us understand these figures somewhat better.

PLANE—a figure whose parts all lie in one plane (flat, level).

POLYGON — a figure — especially a closed plane figure, having many (more than four) angles and sides.

CIRCLE — a closed plane curve consisting of all points equally distant from a point within it, called the center.

ELLIPSE — a plane curve such that the sums of the distances of each point in its periphery from two fixed points, the foci, are equal.

OVAL — having the general form, shape or outline of an egg; ellipsoidal.

RECTANGLE — A parallelogram with all its angles, right angle.

SQUARE — a quadrangle — having 4 sides and 4 angles. A four sided plane figure having all its sides equal and all its angles, right angles.

TRIANGLE — a 3 cornered, 3 sided figure. There are six types of triangles, with different degrees of angles and lengths of sides.

PARALLELOGRAM — a quadrilateral (having 4 sides and 4 angles) the opposite sides of which are parallel.

PARALLELEPIPEDON — a prism with 6 faces all parallelograms (as seen in one of the various forms that Calcite crystallizes, the Iceland Spar variety).

QUADRANGLE — having 4 angles and 4 sides, as a square or rectangle.

QUADRILATERAL — having 4 sides and 4 angles.

QUADRANT — the part of a circle, an arc of 90° — the area included between such an arc and two radii drawn one to each extremity.

PENTAGON — a polygon having 5 angles and 5 sides.

HEXAGON — a polygon having 6 angles and 6 sides.

HEPTAGON — a polygon having 7 angles and 7 sides.

OCTAGON — a polygon having 8 angles and 8 sides.

NONAGON — a polygon having 9 angles and 9 sides.

DECAGON — a polygon having 10 angles and 10 sides.

DODECAGON — a polygon having 12 angles and 12 sides.

QUINDECAGON — a polygon having 15 angles and 15 sides.

TRAPEZIUM — any rectilinear quadrilateral plane figure, not a parallelogram — no two sides are parallel.

TRAPEZOID — a quadrilateral plane figure having 2 parallel and two non-parallel sides.

TETRAHEDRON — a solid contained by 4 plane faces, a triangular pyramid.

OCTAHEDRON — a solid figure having 8 faces (such as a cleaved fluorite crystal).

DECAHEDRON — a solid having 10 faces.

DODECAHEDRON — a solid fiure having 12 faces (such as a Garnet).

ICOSAHEDRON — a solid figure having 20 faces.

These figures and solids are interesting to try to cut either cabochon or with free hand faceting on a flat lap. If a faceting head is available, What Fun!

I may have left some out, let me know what they are!

Do-it-Yourself, twist an ordinary paper clip into an effective

—GEMEASEL—

By J. DANIEL WILLEMS

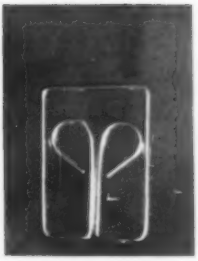


Fig. 1

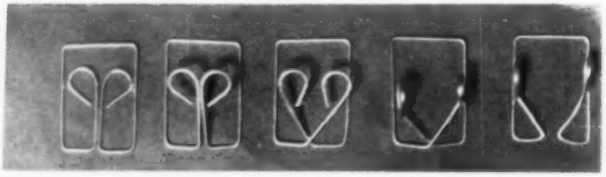


Fig. 2

A GEMEASEL is a simple device for displaying a gemstone, either cabochon or facet, like a painter displays his painting on an easel. The stone is held securely at an angle of about 30 degrees from the surface upon which it is placed. At that angle the stone can catch the light from all sides, including from the rear, and can show off its beauty to the greatest advantage. The gemeasel holds the stone securely so that it is not dropped to roll away and get lost or, what is more important, it is not shattered. Should it drop in its gemeasel the springy grip in which it is held will practically always save the stone from breaking.

Every speaker who has lectured to an appreciative audience and displayed his gems knows that there is always one individual among his listeners whose fingers are long and will yield readily to temptation when a glittering jewel is within easy reach, lying loosely and tantalizingly easy to snatch. Lead him not into temptation, display your gem in a gemeasel.

A gemeasel consists of an ordinary "owl" paper clip, the kind that you can buy in any stationery store. For little more than pennies you can mount a hundred gemstones in gemeasels. Owl paper clips have a crude resemblance to the face of the hooting night bird. They come in three sizes: #1 is the smallest, $\frac{3}{8}$ths by $\frac{5}{8}$ths inches; #2 is $\frac{1}{2}$ by $\frac{3}{4}$ths; #3 is $\frac{5}{8}$ths by $\frac{7}{8}$ths inches. Figure 1 shows a #3 owl clip approximately natural size. When the clip is transformed into a gemeasel it will mount a faceted gemstone from five to 20 carats in weight, or a cabochon from ten to 20 millimeters in the greatest dimension. And it makes no difference whatever what the shape of the stone is, the loops of the clip will clasp and hold the stone whether square, rectangular, round, oval, elliptical, triangular, heart-shaped, or what have you. Look at Figure 3 which shows eight gemstones of various sizes and shapes mounted in three different sizes of gemeasels. The smallest is a faceted round brilliant aquamarine (first row, second from the top), weighing just under one carat, and it is held by a #1 gemeasel. The star sapphire cabochon (second row, third from the top) weighs 4.74 carats and is held by a #2 gemeasel. From these examples it is easy now to estimate the size and weight of each of the others. The largest facet cut stone weighs over 18 carats.

A few readers will be interested at this point in the other six stones. They are: left row, top is a regent cut amethyst facet which weighs about nine carats; third from the top is a triangular opal cabochon; fourth is an elliptical Lake Superior agate cabo-

chon; right, top is a round brilliant amethyst facet; next down is a rectangular step cut facet smoky quartz of over 18 carats; and the last one in the lower right hand corner is a pear-shaped Montana moss agate about ¾ths by one inch in size.

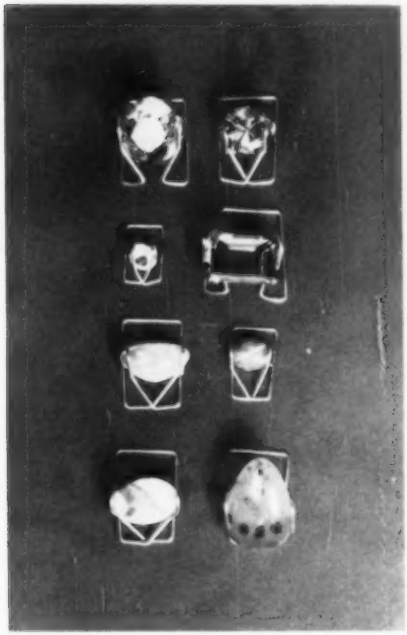


Fig. 3. Polished gem-stones mounted on gem-easels

To make a gemeasel out of an owl paper clip you need only one tool, a simple, flat-nosed pliers. With this you make four bends in the clip, as shown in Figure 2. On the left is shown the clip #3 in its natural state. Next to the right shows the two "eyes", or arms, or whatever they look like, lifted up to make an angle of about 30 degrees with the sides of the clip. If this is not completely clear look at the shadows of the eyes behind and the meaning becomes clear. The second bend is next made by crossing the two limbs and then pulling the eyes apart. Notice that the limbs at the bottom cross each other. The third bend is made to raise the eyes from the flat position to the vertical, and at the same time to straighten the eyes so that they are parallel to the sides of the clip. Now the fourth, last, bend opens up the eyes, makes them larger. The size of the eyes depends on the size of the gemstone to be put between them—the larger the stone the larger the eyes. The eyes must clasp the gem, one on each side. And the open end, or free end, must be up, that is, toward you as you hold the gemeasel in front of you. Your gemeasel is now ready for you to press the gemstone between the two eyes, and the gem is mounted, securely held between the two eyes.

There is another gemeasel in Figure 2, the fifth one in line. This is merely a variation to accommodate stones that are better held by this type of clasping. Here the limbs are not crossed as described previously, but are simply bent apart. Look at Figure 3, upper left hand corner, and also at the second down in the right row, to make the point clear.

After the gemstones are mounted in gemeasels they can be permanently attached to a card by simply driving a staple or two at appropriate angles to fasten the gemeasel securely in place on the display card. It really is very simple. Try it!

(*Continued from page* 162)

At the time of the Midwest Federation Convention in Ishpeming in 1960, many rock hounds had the privilege of swarming over the Lindberg Quarry, the home of Kona Dolomite, and here were found many acres of good collecting grounds where this gorgeous mineral might be easily picked up and carried to our cars by permission of our very generous and gracious host. Thanks a million!

References: (1) Fieldiana Geology, Volume 10, No. 8, August 26th, 1949. 62 pages illustrated. (2) Dr. Eugene Richardson, Jr., Curator of Fossil Vertebrates of the Chicago Natural History Museum, "Some Lower Huronian Stromatolites of Northern Michigan." This is a splendid monograph which everyone interested in Kona Dolomite should have in his library. The price of this booklet is 30¢ over the counter at the Museum. If by mail add postage for mailing charges with your request.

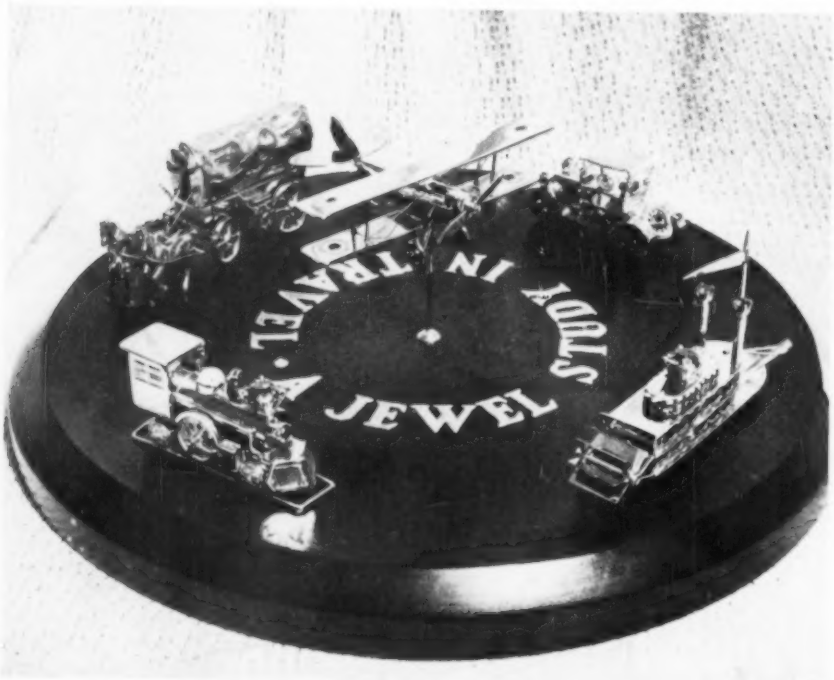
All That Glitters Is Gold

By M. A. FILLMORE

JEWELS and precious metals are normally associated with personal adornment. I have digressed from this general rule in using them to create my small-scale models of some of the modes of transportation used in this country. Perhaps this is because I have always loved the mechanical arts and early in life acquired proficiency in many of them. As a boy in my native Pittsburgh, I always had some kind of a scale model in production, and was happiest when working on it.

My choice of a career was largely determined by a fortunate chain of circumstances while I was with the U.S. Army in Europe. I received some very fine tutoring in jewelry-making there and learned some inside tricks practiced by the old masters of the trade. After my discharge from the Service in 1945 I decided my future lay in the field of creative jewelry. I took further schooling, served a brief apprenticeship, and then entered the employ of one of the finest jewelry houses. After 8 years I opened my own jewelry-making and repair studio.

In my spare time I had been fashioning various gold-jeweled art pieces. But now I envisioned "A Jewel Study in Travel." The finished study is pictured here. It was 3 years (850 hours) in the making. It is a gold-palladium-jeweled reproduction of 5 of the early American modes of travel, i.e., the stern-wheeler boat, covered wagon, steam locomotive, Cadillac automobile, and Jenny bi-plane. Each scale model is 2½ to 2¾ inches long and is completely hand-crafted from flat and round stock precious metals (except the 2 horses), set with diamonds, rubies, sapphires, and opals. The 5 mod-

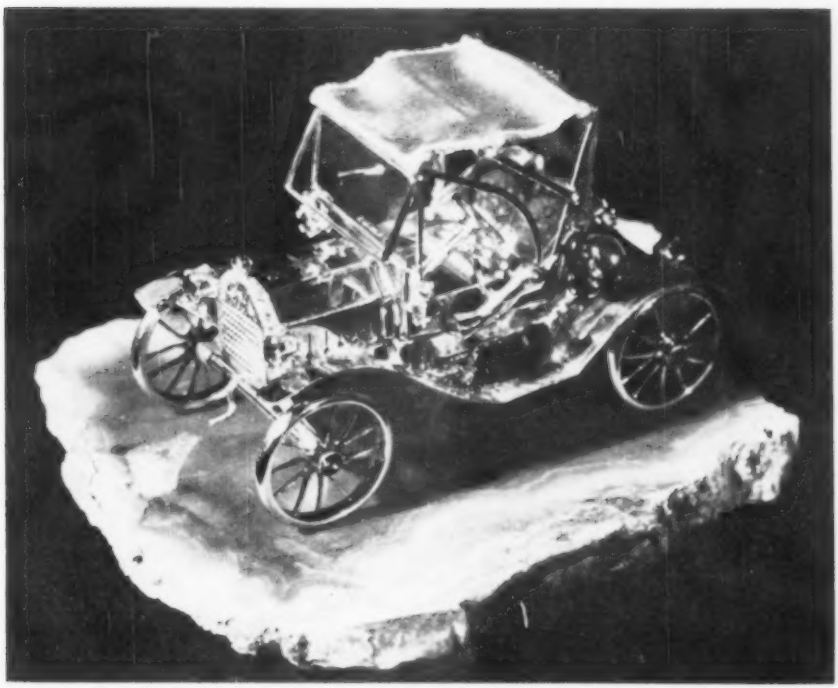


els are mounted on a 10-inch diameter disk of black ebony.

Also pictured is my reproduction of a 1913 Model T Ford convertible. This was a year (350 hours) in the making. The model is 3 inches long and is mounted on a flat piece of brown agate. Materials are gold and palladium. The hood raises, showing a white gold engine and fan. Diamonds, rubies, and sapphires comprise the jewels.

There are problems and tricks of the trade involved in crafting gold-jeweled art pieces. Precious metals and jewels are costly besides sometimes being hard to secure in matching and proper colors. I worked from a previously constructed wooden model. When working with the precious metals some deviation in construction was unavoidable, but I tried to be as authentic as possible. I used gold for large sections, and palladium and platinum for all settings.

All precious metals have to be well protected with solutions to keep from burning them, particularly in large sections. One secret is to make sections as large as possible, then dovetail or bolt them together. Bolts (gold) and nuts and screws can be bought from several findings and optical houses. Polishing is a big factor in that all parts have to have a complete finish before any soldering can be done, then all parts have to be polished after assembly. I used diamonds, rubies, sapphires, opals and a few other gems. For realism I tried to take advantage of the natural colors of the stones. Thus I used yellow sapphires for head-lights, rubies for tail-lights, etc. I used a goldthreaded silk cloth for the Model T top. Cushions are 20 kt. gold to give a wrinkled or cushion effect. Tires are yellow gold.



THE NATION'S LARGEST AND MO
AND JEWELRY SUPPLY HOUS

May we take this opportunity to welcome all local Rockhounds as well as the many vis
We invite you to visit us, both at our new locati

***Complete Stock of* NORTON ABRASIVES & GRINDING**

Your choice five pounds of any one or any mixture—Mariposite—Golden

Jewelry Findings

ITEM	*DESCRIPTION*
1	18" NECKCHAINS Complete with Spring Ring, 18 kt. Gold or Rhodium Plate, 15¢ each; $1.20 dozen
2	14" NECKCHAIN of Anodized Aluminum—Gold or Silver—the Very Best in Aluminum Chain, 15¢ each; $1.50 dozen.
3	18" NECKCHAINS—Soldered Link Fine Chain—18 kt. Gold Plate or Rhodium Plate, 40¢ each; $3.75 dozen.
4	6mm HALF BALL DROP EARSCREWS—18 kt. Gold or Rhodium, 20¢ pair.
5	6mm HALF BALL DROP EARWIRES—Sterling Silver, 35¢ pair.
6	DAINTY HEART DESIGN EARWIRES FOR PIERCED EARS—Gold Filled, 35¢ pair.
7	SNAKE KEY CHAIN—Gold or Rhodium Plate, 1 for 30¢; 3 for 75¢; $2.50 dozen.

8 OPAL OR GEM BALLS—9/16" Dia. Plastic Ball with press fit cap with eye for hanging on chain, 35¢ each; $3.25 dozen.

#28

#14

Do It Yourself Bracelet

16 high quality small tumbled amethyst stones average 5-6 carats
16 sterling bell caps
16 sterling jump rings
1 beautiful sterling chain bracelet

$8.95 complete

Compare with any $35.00 value

STAR	#28	#14
ROCK CRYSTAL	$1.10	$ .75
TIGEREYE	2.25	1.35
OBSIDIAN	1.25	.65
JADE	2.50	1.25
AVENTURINE	2.50	1.40

MATCHED PAIRS OF BEAUTIFUL AGATIZED CORAL IN TUMBLED STONES FOR EARINGS — Pair 65¢

AMERICAN GEMS AND

9775 South Dixie Highway, M

Citrin
Amet
Aqua
Morg
Titani
Beryl

Tourn

Kunzi
The On

We
to c
when

ND MOST COMPLETE LAPIDARY
Y HOUSE AND SHOWROOM

as the many visitors we shall have to the National Gem & Mineral Show at Miami. our new location and at our booth in the show.

GRINDING WHEELS *ROUGH CUTTING MATERIAL SPECIALS*

posite—Golden Sheen Obsidian—Golden Tiger Eye $3.75 Plus Postage.

FACETED STONE SPECIALS

Any size—any cut—price per carat

	Light	Medium	Dark
Citrines	60c	75c	$1.00
Amethyst	65c	85c	2.50
Aquamarine	$1.50	$3.00	——
Morganite	2.00	5.00	——

Titania Rd. Brill.—$6.00 ct. up to 3 cts.

Beryl—Oval or Emerald Cut

Green	Yellow	Golden
$2.00 ct.	$2.00 ct.	$4.00 ct.

Tourmaline—All colors

Oval — Emerald — Cabochon — Cats Eyes

Prices on Request

Kunzite—$12.00 per carat up to 5 cts.

The Only Natural Rare Stone of Violet Color

We will repair any watch for $5.25 that is not too badly damaged in our opinion. Maintaining on our premises with the most up-to-date and complete equipment we can offer as an added service to our customers fine guaranteed watch repairs and expert jewelry repairs and made-to-order jewelry.

We are direct importers and manufacturers. No middleman to contend with. Compare our quality. The best prices anywhere. You must be satisfied or your money refunded.

AND MINERALS, INC.

Highway, Miami 56, Florida

Sight Identification of Glacial Pebbles

By W. J. BINGHAM

THE problem of the person, especially beginner, collecting rocks from the glacial drift-covered region of the north central United States is quite different from collecting outside of this region. This article will deal specifically with collecting in the upper Mississippi basin and the western Great Lakes area, but may be applied, more or less, to any glaciated region. Sight identification of glacial pebbles can not be 100% perfect, but can be 90% or thereabouts with a little practice. A listing of *all* the varieties of rocks found in the glacial drift would be a huge project, so this article will be limited to those that are the most common and those that are the most desired by rockhounds.

A study of the glacial drifts of this region also is a must, if a person is to hunt rocks intelligently. A hit or miss system of hunting is never satisfactory. Hunting rocks in the glacial drifts is not covered in the average book as the glacial pebbles are a water worn mixture of every kind of rock that the glacier had gone over, and they will not appear like the classic pictures ordinarily seen. The original location and the associated rocks cannot be determined except in a very general way, thus these facts cannot be used for identification purposes. The problem then is to pick out the desirable stones from this mixture. There is no known short-cut to learning to identify stones, but any one who will study and practice, can learn to recognize the most common ones easily.

A person must also learn a new vocabulary if he is to converse with others, or read books about rocks and minerals. Below are a few books that are recommended for reading, although they do not touch on the identification of glacial pebbles on sight. A good standard dictionary is a big help, as well as "A Dictionary of Gems and Gemology" by Shipley. "Identification and Qualitative Chemical Analysis of Minerals" by Smith is very complete although somewhat technical. "How to know the Minerals and Rocks" by Pearl is also very good as it contains keys to identify the most common rocks and minerals. For a study of the rocks and how they got where they are, I would advise the reading of the following United States Geological Survey publications: "Moraines and Shore Lines of the Lake Superior Region," Professional Paper 154-A, and "Quaternary Geology of Minnesota and parts of Adjacent States," Professional Paper 161; these are now out of print but may be obtained from the public libraries or sometimes from the second hand book stores. Another good book that is put out by the University of Minnesota is "Minnesota Rocks and Waters" by Schwartz and Thiel.

A glacier occupies two regions—one where it is picking up material and one where it is depositing it. These regions may be as much as several hundred miles apart. As a glacier has an opportunity to pick up stones from a number of formations, it will thoroughly mix them and then deposit them where it is melting, thus forming what is called a glacial drift. Thus a knowledge of the area passed over by a glacier will give a person a very good idea of the kind of rocks that will be found in the drift as pebbles. In general all the softer rocks will be ground up to clay and sand, and the harder ones will appear as pebbles or boulders. As a glacier melted it released large volumes of water which washed some of the drift down the drainage ways and river valleys outside of the area occupied by the glacier.

Another problem confronting the beginner is nomenclature. For example, some people separate agates from jasper on the basis of translucency, thus if a crypto-crystalline quartz pebble is translucent it is called agate, while if it is opaque it is called jasper, no matter what its pattern or appearance may be. In this article I will use the system whereby the crypto-crystalline quartz pebbles are separated on the basis of their method of origin, pattern or lack of pattern, crypto-crystalline structure, and general appearance. Thus the amygdaloid nodule will be called an agate, the sedimentary rock will be called jasper and the one that is segregated from the limestone will be called chert (or flint). The crypto-crystalline quartz minerals can also be divided into two groups, one with the crystallites parallel to each other (agate) and one with the crystallites in a random orientation (jasper and chert). It is seen that the system that we will use here has several determinative

properties, instead of just one. Some people will not agree with the above system, but I think it is the best one to use on glacial pebbles. The foregoing may seem like a lot of big words, so use your dictionary, as I do not know of any smaller ones that will express what I want to say.

This brings us up to the big problem of the rockhound: HOW CAN I TELL AN AGATE FROM ALL THE MILLIONS OF ROCKS THAT I CAN SEE IN A GRAVEL PIT OR LAKE SHORE? First, you should determine that the gravel is of the correct origin to contain agates. This calls for a study of the last three of the above mentioned books. Secondly, you should know that there are several other varieties of rocks present in the drift that will appear like agates when seen on the ground or from a distance, such as jasper, chert, quartzite, massive or vein-quartz, silicified wood, etc., which will, like agate, appear a little smoother or shiny or more polished than the rest. They will also most always appear more translucent than others, but not always.

Now, when you pick up one of these shiny or translucent pebbles, the first thing to look for is the agate banding. This is easily the most prominent feature of an agate and is not found in any other rock. In case it is a whole nodule of agate without any of the pattern showing, identification is by the translucency and the fact that the nodule has no sharp corners and is well rounded all over. Sometimes there are shallow pits on the outer surface of the nodule. It will also be noted that the banding in an agate is approximately parallel to the outer original surface of the nodule. The Lake Superior agates are predominantly red in color but a substantial percentage may be either clear, white, grey, brick red, tan or brown. Your eye will have to be trained before you will be able to see the slight variations in polish and translucency, so do not expect to be an expert the first few times you try to find agates. Do not try to identify rocks that are covered with mud or clay, wash them first. Also important in looking for agates is the fact that you must get to the hunting grounds before anyone else, as hunting in a well picked over area is not very profitable.

As to the other quartz crypto-crystalline rocks found in the glacial drift of this region, the most common is jasper. Some part of the formation is called

"taconite" by the iron miners, as sometimes it contains quite a bit of iron, sometimes as much as 20% of iron oxides. This will cause it to appear quite metallic on a fresh break or a polished surface. Jasper can be identified by the lack of distinct banding, algal structures, no evidence of pitting or of an original outer surface. Algal structures may be recognized by a horizontal wavy obscure banding, or by small rounded designs, which are most always about 1/16 inch in diameter but rarely may be as much as two inches in diameter. They are usually dark red and black. As jasper is a very large formation (about 10 miles by 150 miles by 600 to 800 feet thick on the Mesabi range alone), any glacial pebbles that are found are only very small fragments of the original. It is usually some shade of red, but may be grey of any shade from light to dark and may be translucent to opaque.

The other quartz crypto-crystalline rock is chert (or flint). It is usually grey or brown in color, but rarely is red or yellow and sometimes has a white or grey coating caused by weathering on the outside of the pebbles. There is no banding but sometimes there is an indistinct mottling. Occasionally there are invertebrate fossils found in the chert. It is usually opaque, but sometimes is translucent. As chert is a quartz segregation in limestone, the original outer surface was very irregular and sometimes shows on the glacial pebbles as holes and porous areas.

The three crypto-crystalline quartz rocks listed above have a well defined conchoidal fracture, a semi-vitreous luster, a hardness of seven and are quite tough.

Quartzite is a quartz sand cemented by more quartz in a varying amount, thus the porosity varies from almost zero to about 25%. It can be recognized by the granular structure and the fact that it breaks through the grains, not around the grains as does sandstone. It is mostly white but sometimes it is stained some other color. As it is crystalline quartz, it has a vitreous luster and a hardness of seven.

Massive or vein quartz can be recognized by its vitreous luster, a hardness of seven, a conchoidal fracture, a lack of cleavage, is almost always white and translucent, and usually has a frosted appearance on the outer surface.

Petrified wood from this area of the glacial drift is almost always grey in color, the annual rings are prominent to obscure, varies from slightly translucent to opaque, has a hardness of seven and usually has a dull fracture. It often splits along the annual rings.

There are a few other varieties of quartz found in the drift, but they will not be described here as they are not very common or very attractive. All of the above varieties of quartz will have a specific gravity of approximately 2.6 and a refractive index of approximately 1.54, if anyone cares to use them as identifying characteristics.

Other than the quartz varieties mentioned above there are only a few rocks that the rockhound needs to know, although there are hundreds of varieties in the drift. They are mostly granular in texture, softer than quartz, mostly opaque and are in well rounded pebbles. *Basalt* is dark blueish to black (although it weathers to a much lighter color), dense and usually fine grained; occasionally it is porphyritic. *Rhyolite* is coarser grained, also occasionally porphyritic and is usually reddish in color. Both basalt and rhyolite are sometimes amygdaloydal. *Granite* is coarse grained in texture, red, pink or grey in color, not as dark as basalt or rhyolite and sometimes has veins of massive epidote running through it. Any one pebble of granite usually is of uniform color and texture. *Gneiss* is also coarse grained, but is mottled red, pink or grey and does not have a uniform color. *Limestone* is usually tan or grey in color, quite soft, not usually granular and often contains invertebrate fossils.

Again let me say in conclusion that this article is concerned *only* with *glacial pebbles* and their identification, rather than with their origin and geologic history.

Book Reviews

NEW MEXICO GEM TRAILS. Bessie W. Simpson. Gem Trails Publishing Company, Granbury, Texas. 1961. 88 pp. $2.50.

What Mrs. Simpson has given us is exactly what her title indicates, i.e., an enumeration and description (with maps) of some 40 trails leading to known sources of gem material in New Mexico. These sources may be mine dumps, ridges, arroyos, or stream beds.

A key map shows the state and seven of its principal cities plus the main highways which traverse it. It is divided into 4 sections by drawing a vertical line just east of Santa Fe and a horizontal line just south of Socorro. The text is arranged under these 4 sections; the 2 western sections are considerably richer in gem trails than the eastern. In the former the trails lead to agate, opalized wood, Apache tears, turquoise, and other items prized by collectors. In the latter are the Pecos diamonds, fairy crosses, and Folsom artifacts.

Directions are interspersed with glimpses of scenery and bits of local history, particularly around ghost towns. The author herself has followed practically all the gem trails which she describes.

The reader will appreciate Mrs. Simpson's concern for his safety and comfort. "This is rattlesnake country so be careful," she warns of one location. She alerts us to sand sometimes deep enough to trap our wheels. Landowners will also appreciate her regard for their rights and sensibilities. Use common sense and obey the golden rule is Mrs. Simpson's admirable formula.

THE PEARL KING. Robert Eunson. Greenberg (Chilton Company Book Division, Philadelphia). 1955. 242 pp. $3.95.

This work by the chief of the Associated Press Bureau in Tokyo reads as easily as a book of fiction, but is a factual, educational portrayal of the development of the cultured pearl industry.

It is also the life story (94 active years) of the fabulous MIKIMOTO, a street peddler of noodles and sea food, who became one of Japan's richest and most beloved men. Toward the end of the last century he began experiments to induce oysters to produce pearls. After 12 years of costly and discouraging failures he hit upon the secret of inserting a granule of mother-of-pearl into the flesh of a 3-year-old oyster. By 1913 MIKIMOTO'S process had produced cultured pearls that were indistinguishable from natural ones except by X-ray. Mr. Eunson traces the history of cultured pearls from its beginnings to the middle of the last decade.

If you are interested in pearls this book will fascinate you and be a welcome addition to your library. Over 30 photographs add to its interest and value.

R.K.

ACTIVITIES IN EARTH SCIENCE. S. N. Namowitz. D. Van Nostrand Co., Inc. 1961. 180 pp.

This is a Laboratory Manual designed for use with the textbook "Earth Science. The World We Live In," which was reviewed in our April 1960 issue. The 48 exercises outlined can be performed by students of secondary schools with a minimum of assistance from the teacher. The materials required are simple, i.e., maps, a compass, mineral specimens, a few chemicals, a thermometer, etc. The Manual itself includes special graphs and tables when these are needed.

The range of subjects covers continental glaciation (clarified by relief and topographic maps) and determination of dew point and relative humidity. Questions and directions for performing the exercises are preceded by a statement of purpose, background, and a list of materials needed.

Teachers will find that use of this aid deepens the student's understanding of earth science and encourages independent observation.

TEXAS GEMSTONES. Elbert A. King, Jr. Bureau of Investigations No. 42. Bureau of Economic Geology, University of Texas. 1961. 42 pp. 40c.

As in most books on minerals it is the photographs of actual specimens, identified as to source, which enliven the text. Mr. King has chosen to present some interesting crystals, particularly of celestite and topaz. Even in black and white photographs, they adequately suggest the richness of Texas gemstones. Three forms of tektites, almost a Texas exclusive, are shown, and a striking Texas agate.

The title of this book does not prepare the reader for the rather complete outline of the cutting, polishing, and faceting procedures. These are well illustrated by numerous drawings.

Over twenty gemstones found in Texas are discussed in alphabetical order, from amber through turquoise. Composition and properties such as crystal system, hardness, cleavage, tenacity, etc. are listed for each. Location in the state is given by reference to counties and sometimes to towns or ranches. The author occasionally advises as to the best method of recovering the gemstone and estimates its aesthetic value to the collector.

THE WORLD OF GEOLOGY. Edited and introduced by L. Don Leet, Professor of Geology, Harvard University, and Florence J. Leet. McGraw-Hill Book Co., Inc. 1961. 262 pp. $4.25.

Although this book is not an original composition but a compilation of material adapted from articles and from other books, it has been prepared with skill and judgment. Sources are top grade, i.e., Scientific American, Geotimes, Life, and such authors as Raymond, Carson, Pearl, Shand, the Fentons, etc.

After an introduction in which the editors ascribe the delay in the birth of geology to the arbitrary dictums of Aristotle, the text is presented in a series of 19 chapters ranging over the origin of the earth, development of life and its record, the oceans, the glaciers, volcanoes, materials of the earth, etc.

While much of the material is descriptive, drama is present in the chapter on Louis Agassiz and in the account of the record-breaking dive of the bathyscaph "Trieste."

The editors drew on Harvard University collections and other sources for outstanding photographs to illustrate their subject matter.

How To Open Geodes

By JERRY OSTROM

GEODES CERTAINLY AREN'T the hardest things in the world to find. Many good geode collecting sites are well known and it seems collectors are more apt to tell you about their geode collecting sites than to give you information about almost any other item. This is probably because once you discover a geode location, each succeeding year of erosion uncovers new material so that a good geode location is a constant challenge to keep you trying to find that one with millerite, celesite, fluorite, sphalerite or some new and unusual inclusion in it. However, just finding a geode is only a small part of the building of a good geode collection.

The next important step is opening them. This can be done rather informally by bashing the geode a few good blows with a hammer or it can become a very deliberate and thoughtful process. Either process may result in complete success or a total mess, however the more deliberate and thoughtful process which I will attempt to explain has helped my son and me to accumulate a collection of geodes that we think is very beautiful. CONTRARY TO MANY OTHER SUGGESTIONS we have read about, we prefer to crack geodes on a hard surface without the benefit of any starter cuts on a saw. Before a geode is subjected to any pounding, it should be washed and carefully inspected. During the washing process, you will usually find some geodes sending up a column of bubbles just like a leaky tire. Take these out first, keeping track of the origin of the bubbles, and inspect more closely for signs of a natural crack that can be forced open with the help of a small chisel.

ONE IMPORTANT STEP to remember when using a chisel on a geode is to never hit the chisel a second blow until you are absolutely sure what sort of results the first blow produced.

With experience, you will acquire an ear that will tell you when the hammer blow has started a crack in the geode. Once you have reached this point, you need to double your caution about rushing the process so that the next blow doesn't produce a shattering effect that leaves you reaching for the glue or worse yet, with a mass of rubble.

AFTER TAKING CARE OF ANY BUBBLERS you may have, you should inspect carefully for natural cracks that nature has made while the geode was still in the ground or while the geode was being rolled around in a dry run or creek bed. These geodes are rather easy to open successfully if you apply light chisel pressure along the line of the natural crack but if you hit one of the geodes too hard in some way so as to put pressure in opposition to the natural line of the crack, you will probably end up with a break that will pretty much ruin the specimen. Often you will find these geodes stained on the inside and may even be partly filled with mud but careful soaking and washing can usually restore them as desirable specimens.

OXALIC ACID USUALLY CAN BE USED to clean off iron stain but it also bleaches the outer shell of the geode and of course would destroy some inclusions that might be in with the quartz.

PROBABLY THE NEXT INSPECTION should be to sort out the lightest geodes that remain and study them carefully to determine where you could expect to get the cleanest break and expose the maximum beauty of the geode. This is chiefly determined by the shape of the geode. If it is elliptical in shape and is bigger around than it is thick you probably would get the most interesting break by standing the geode so the thinner plane is horizontal to the floor and apply a small chisel in a position where it is least likely to slip off the narrow edge at the top of the geode and apply light pressure by tapping once lightly and then listen or look to see if a crack has started. After several light blows

have not produced a crack, stronger pressure should be applied but still only hit the chisel once then inspect. This caution often saves a geode that for some unknown reason, cracks in a manner different than you expected. If you see this contrary crack quickly enough, you can quit your original attack and treat the geode just like the ones that have a natural crack in them.

FREQUENTLY YOU WILL FIND a geode with a flat spot on it. This irregularity can be exploited by attempting your break parallel with the flat spot. This is a very difficult break but produces beautiful display specimens when you are successful. Because the geodes that have flat spots on them very often also have a thinner wall along the flat spot it is usually more difficult to break this kind of a geode than the more round type of one.

AFTER YOU HAVE OPENED ALL of the lighter geodes, you probably will still have a goodly number that definitely aren't light, but while out in the field, they seemed to appeal to you for some reason, so you should attempt to open them. It is still important to look for stress lines that seem to run completely around the geode so that the heavier pressure necessary to crack these geodes will still result in a clean two piece break. Also one should try to visualize how anything on the inside would best be displayed and let this also influence where you are going to place the chisel.

MANY GEODES WITH FINE QUARTZ crystals in them have thick walls and therefore seem heavy, also a heavy geode may be filled with calcite crystals, dolomite or even a fine sphalerite crystal so it is worth the effort to open these heavier geodes but one should be prepared for more disappointments than when opening the lighter ones.

GEODES OVER FIVE INCHES in diameter require a somewhat different attack. The careful inspection both for possible natural cracks or stress lines that would carry a break completely around the geode should still be sought. The difference between opening these larger geodes and the small ones is in how to apply the chisel. First off, you should use a larger chisel and about a two pound hammer. After you have decided where you would like the geode to break, you start a grooving process with the chisel applying only enough pressure on the hammer to start a groove in the geode but not enough to break it open. Here again you should hit then inspect to be sure that the geode doesn't open in some direction contrary to your desires. After you have a groove all around the geode, start applying heavier blows until you finally get a break.

IN OPENING THE HEAVIER geodes, there often is a point beyond which further effort doesn't seem wise. This you need to decide for yourself. Many will be solid so you need to give up sometimes. It all depends on how well you like to sharpen your chisels because a prolonged attack on a solid chalcedony geode can really take the edge off your chisel in a hurry. A suggestion for storing geodes that we find useful is to hold the two pieces firmly together with a rubber band. It is also useful to slip a piece of paper under the band on which you have noted the quality of the geode and the type of inclusions that it has. A careful examination with a magnifying glass will help you locate unusual inclusions or crystal forms that would add value and interest to the specimen. Don't forget a check for fluorescence.

'61 MIDWEST ROCKRAMA

THE **Indiana Geology and Gem Society** will be host to a Midwest Federation "Rockrama," to be held in the Agricultural Building at the **Indiana State Fairgrounds, Indianapolis, Indiana, October 6, 7, and 8, 1961.** Hours on the 6th and 7th will be from 10 a.m. to 10 p.m., and from 12 noon to 9 p.m. on the 8th. Dealer space is available by contacting show chairman Charles O. Mull, 915 E. 49th street or club president B. E. Earnest, 6120 Eastridge Drive, Indianapolis, Indiana. Security is to be handled by the Burns Detective Agency. This show will be of special interest to individuals who are interested in the Art of Lapidary, and to collectors of Minerals and Fossils.

Midwest Club News

Mrs. Bernice Rexin, Club Editor
3934 N. Sherman Blvd.
Milwaukee 16, Wisconsin

MESABI ROCK AND MINERAL CLUB has assumed the duty of caretaker for the earth science collection of the Hibbing Junior College. This is one of the finest collections of its kind in the state of Minnesota and includes gems, minerals, fossils and rocks from six continents. It contains nearly 3000 specimens and is valued at between $5000 and $15,000. Labels read: Blue Halite from Bavaria; fine sulphur crystals from Girgentia, Sicily; native platinum in grains from the Ural Mountains, Russia, and so on. . . A number of displays will be made from the collection and these will be exhibited in locked showcases in schools, museums, libraries and other places.

ILLOWA GEM AND MINERAL SOCIETY enjoyed a talk on "Paleontology" by Roger Spitnos of Augustana College. After the lecture he identified fossils for members and answered questions in such an interesting fashion that members were reluctant to go home at the close of the meeting. The society reports that the members of the earth science staff of Augustana College are always willing to give lectures or teach a class for the club, and that the club is given the freedom of the college museum on meeting nights.

KANSAS CITY LAPIDARY CLUB at its May meeting featured a slide program, "Gems in Religion," by Russell Kemp. The colored slides included pictures of the Jade Window in the North Shore Baptist Church in Chicago; Aaron's Breastplate; "Gethsemane," a framed window in Compton, Calif.; and the Grotto at West Bend, Iowa.

MINNESOTA MINERAL CLUB planned to make a 170-mile trip to Rockford, Iowa on June 17 and 18 to hunt for fossils. Although the society did not name the kind of fossils found here, it did state that they were very plentiful.

INDIANA GEOLOGY AND GEM SOCIETY on May 5 heard Verne Montgomery, the Central Regional Vice-President of the Midwest Federation, present an excellent program on "Asbestos." Quick-witted and energetic, Mr. Montgomery is always an entrancing speaker.

The society planned to hold its annual gold-panning trip to Sycamore Creek on June 25. Equipment needed for this trip is a pan for panning gold (a darkened pie pan or a skillet with sloping sides will do), a small, *tightly* stoppered bottle for holding gold flakes, and a pair of wading boots.

MIDWEST MINERALOGICAL AND LAPIDARY SOCIETY on May 21 made a field trip to Hungrey Hollow, Ontario, Canada to collect Devonian fossils, including corals, snails, brachiopods and ammonites. The favosite and placenta corals in this area are solidly replaced by silicates and can be polished like petoskey stones. A map and directions to this abundant source of fossils is included in the May issue of the society's publication, *The Rockpile*.

LINCOLN GEM AND MINERAL CLUB will hold its annual gem and mineral show on Oct. 17 and 18, 1961. For full details on this show, write: Mrs. Frances Tracy, 3601 South Street, Lincoln, Nebraska.

FOX VALLEY ROCKS AND MINERALS SOCIETY invited the Chicago area clubs to its June 12 meeting at which three colored movies were shown. The first film featured the spectacular "New York-Au Sable Chasm" and the remaining two films, "The Eternal Gems" and "King of Gems," dealt with diamonds.

CEDAR VALLEY ROCKS AND MINERALS SOCIETY enjoyed hearing Dr. H. Hendricks, head of the Geology Department of Cornell College, give an interesting talk on a very controversial subject, "The Crust of the Earth and the New Theories on Mountain Building." Recently the society sent a check to the Cedar Rapids Science Fair Committee for the purpose of purchasing gifts for the winners at the fair.

WISCONSIN GEOLOGICAL SOCIETY at its May meeting heard Robert Haack relate his diamond-hunting experiences in the jungle of British Guiana. The diamonds found in this area are recovered from the gravel on the bottom of a river that is also infested with the deadly piranha fish. The tropical climate, snakes and insects make diamond mining in this area uncomfortable and hazardous. Mr. Haack also brought a very charming native of the jungle to the meeting, his beautiful, four-month-old, pet ocelot.

MICHIGAN GEM AND MINERAL SOCIETY recently heard Irving Granger talk on "Woodland Indians." Most eye-catching of the displays of cultural objects of the Woodland Indians, that were shown by Mr. Granger, were the colorful, feathered headdresses.

CHICAGO ROCKS AND MINERALS SOCIETY'S Paleontology Division on May 17 heard Dr. David R. Lauck, entomologist and curator of invertebrates at the Chicago Academy of Sciences, speak on "Fossil Insects." He described the evolution of insects as interpreted from their fossil record and illustrated his talk with fossil insects enclosed in amber from the Baltic area and those found in nodules from the coal-bearing Pennsylvania strata.

CENTRAL IOWA MINERAL SOCIETY recently heard an informative talk on "Talc" by Irene Ullius. She also displayed various kinds of talc, and some exhibits from the companies which had supplied her with information and products made from talc.

NEBRASKA MINERAL AND GEM CLUB on May 7 visited the Grotto at West Bend, Iowa. Father Dobberstein used 44 different minerals to make the Grotto of Redemption, which is comprised of nine units, each one illustrating a part of the story of man's downfall in the Garden of Eden and his redemption by the Saviour.

EVANSVILLE LAPIDARY SOCIETY at a recent meeting found Merton Young's talk on "Fossils," and his collection of fern fossils very interesting. The next day several of its members accompanied Mr. Young to the strip mine area at Terre Haute, where they collected several sacks full of fern fossils.

ISHPEMING ROCK AND MINERAL SOCIETY learned about an unusual facet of lapidary at a recent meeting when Mr. and Mrs. Kronquist exhibited five of their pictures made of beach stones, and explained how they were made. The club's favorites were a Ubangi man made of diorite stone tumbled by the waves of Lake Superior and a woman called "Amy" who was made of amygdaloid picked up on the shores of Lake Superior. Mrs. Kronquist also does oil and water color paintings and has won many prizes for her work.

DES MOINES LAPIDARY SOCIETY reports that the State of Iowa has purchased the four best pieces from Dr. B. H. Beane's world famous collection of fossil crinoids and starfish, for $10,000. The most valuable specimen purchased by the state is a stone slab some three by five feet in size containing 180 complete fossils of a starfish that has been found no where else in the world. Dr. Beane was pleased to sell these specimens to the State of Iowa, although it reduces the value of the remaining part of his collection (for which he has a standing offer) by more than $10,000. These fossils were found in Iowa and Dr. Beane felt that the finest should remain in Iowa. The superb specimens purchased by the state will be housed in the Iowa Historical Museum in Des Moines, Iowa. Be sure to visit this Museum when you attend the American Federation Convention in Des Moines in 1962.

SILOAM SPRINGS EARTH SCIENCE CLUB reported that it had a very good attendance at its spring show of rocks, minerals, fossils and gems, and that displays were better and more numerous than in previous years. Recently the club collected many good geodes while on a field trip to Hamilton, Ill.

CENTRAL MICHIGAN LAPIDARY AND MINERAL SOCIETY recently heard Harry Hardenburg from the Michigan Department of Conservation speak on "Iron in Michigan." The iron deposits in Michigan were laid down one and one-half to two billion years ago. In this geologic era an iron sea was formed in Michigan; later the sea dried up leaving a layer of sand and quartz on the bottom, on top of that a layer of iron, and finally a layer of shale. The major portion of Michigan iron ore is low grade, containing about 25% iron, but this is economically processed into an enriched product containing 60 to 65% iron. It is estimated that there are 750,000,000 tons of iron ore deposits in Michigan, which should take care of our present day needs for about 200 years.

TRI-STATE GEM AND MINERAL SOCIETY OF DUBUQUE was host to the Waterloo and Cedar Rapids Societies on May 27th. It conducted three separate field trips and reports that the agate-hunters found an abundance of agates; fossil hunters were pleased with their finds, especially Mrs. Long of Waterloo, Iowa, who found a rare type of Ordovician trilobite. The mineral-hunters returned home loaded with sphalerite, calcite and golden, glittering marcasite. The highlight of the meeting was a talk on "Asbestos" by popular Verne Montgomery.

GRAND RAPIDS MINERAL SOCIETY at its May meeting welcomed Doris Kemp back as a favorite guest speaker. Mrs. Kemp gave the group a demonstration lecture on wire-lacing jewelry, a solderless method of making jewelry. Last year Mrs. Kemp told the society how to make V-lock jewelry and a display of V-lock jewelry created by the members was made at the meetings to show Mrs. Kemp how much the club had benefited from her talk.

MICHIGAN MINERALOGICAL SOCIETY at its May meeting featured an interesting slide lecture program on "Fossils," which was presented by Dr. John Sanford of Wayne University. Dr. Sanford stated that one of the best-known collecting areas for Devonian sponge, coral, blastoid, and crinoid fossils is at Arkona, Ontario, Canada. Manitoulin Island in Ontario, he said, is relatively unspoiled for the fossil-hunter. Of great interest was his detailed description of an almost complete mastodon skeleton found in a swamp in Indiana 30 years ago.

DES PLAINES VALLEY GEOLOGICAL SOCIETY'S April trip to Schullesburg and Cassville, Wisconsin netted its members calcite, galena, marcasite and Lake Superior agates.

FLINT ROCK AND GEM CLUB made a three-day excursion to Michigan's copper country to collect datolite, greenstones (chlorastrolite), agates, and thomsonites.

BLACKHAWK GEM & MINERAL SOCIETY heard an interesting lecture on "Prospecting for Gold," by Glen Stephens. He demonstrated the use of a gold sifter and gave information on prospecting for gold in Arizona and Colorado.

EARTH SCIENCE CLUB OF NORTHERN ILLINOIS on May 12 heard Dr. Ben Hur Wilson, editor of *Earth Science*, speak on "Geodes." His talk was illustrated with slides of geodes with various inclusions and maps showing the locations of geode beds in southeastern Iowa, northeastern Missouri and western Illinois.

ELKHART MINERAL SOCIETY is collecting "top value" stamps which it plans to exchange for a Bell & Howell projector. Travelers who have picked up "top value" stamps that they do not expect to use could help the club by sending them to: William Cole, President, 3816 Cassopolis St., Elkhart, Indiana.

MICHIGAN LAPIDARY SOCIETY on May 18 learned a great deal about the fine points of silver-smithing when metalsmith Jim Gilchrist presented a demonstration lecture on the subject and showed two films dealing with silversmithing that were obtained through the courtesy of Handy and Harmon, refiners of precious metals.

AUSTIN GEM AND MINERAL SOCIETY on May 23 learned from Russell Lidberg, editor of *Achates*, how Lake Superior agates were formed, from whence they derived their characteristic color, and many other interesting facts about them. Lake Superior agates are found near Austin, Minnesota.

Other Societies

OKLAHOMA MINERAL AND GEM SOCIETY recently visited the home of Ocus Stanley, east of Mt. Ida, Arkansas, to view his collection of quartz crystals, wavelite and novaculite. Later the group collected many, many fine quartz crystals from Mr. Stanley's quartz crystal claims on the crest of Fischer Mountain.

MIAMI MINERAL AND GEM SOCIETY reports that a member of its board, Jim Stoinoff, has recently acquired an 82-carat opal which he has cut into a cabochon with an appraised value of $3000. Other gems in Mr. Stoinoff's collection of rare-sized stones that he has cut and polished include, a 50 carat cornflower blue star sapphire; a 60-carat rutilated quartz; 100 carat citrine; an amethyst crystal weighing 200 carats; and a 1000 carat smoky quartz crystal that he has cut into a gem with over 500 facets.

MINERALOGICAL SOCIETY OF PENNSYLVANIA held its annual meeting in Blue Ball Quarry and elected Leonard Gerhart as its new president. Hunting for the calcite, fluorite, hematite, pyrite, quartz and rutile found in this quarry was cut short for the group by a heavy rainstorm, but not before some good pink dolomite and fluorite were found.

COLORADO MINERAL SOCIETY recently collected petrified wood and manganese concretions on the Lowry Bombing Range. Special permission is needed to collect here and caution should be used to avoid possible live shells on the range.

NATROMA COUNTY ROCKHOUNDS have made numerous jade-hunting trips to its nearby hills. It is rumored that one of its members, Archie Tillman, is using jade to finish the bathroom in his new home.

RAWLINS ROCKHOUNDS recently heard Eugene Gallaway, Archeologist from the University of Wyoming, discuss the various classifications of Indian Arrowheads. His lecture was illustrated with examples of Folsom and Midland Indian points.

2 ALL NEW CATALOGS

CATALOG 58-59

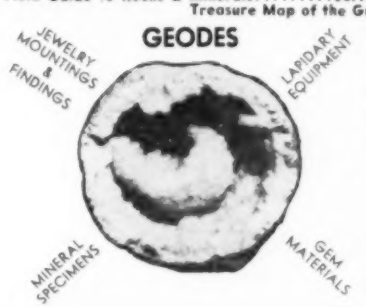
OVER 170 PAGES . . . 46 pages of mountings & findings with new styles never before cataloged. 28 pages covering geodes, minerals, rough gem materials and baroques. 84 pages of machinery, tools, and supplies. 8 x 11 size, completely indexed and bound with a heavy durable cover **$1.00 in stamps or cash postpaid.**

CATALOG 1960

OVER 70 PAGES of the newest styles of mountings and findings in filigree, sterling silver, gold filled, gold and rhodium plate. 33 styles of new filigree mountings. Fully illustrated with hundreds of photos. One of the largest catalogs of its kind ever published. 8 x 11 completely indexed and bound with heavy durable cover. **50¢ in stamps or coin postpaid.**

BOOKS . . . BOOKS		BOOKS . . . BOOKS	
Midwest Gem Trails	$2.00	Lake Superior Agate Book	$2.50
Northwest Gem Trails	$2.00	Gemstones of North America	$15.00
Colorado Gem Trails	$2.95	Quartz Family Minerals	$3.75
Arizona Gem Fields	$2.50	Gemcraft	$7.50
The Agate Book	$2.00	Gem Tumbling	$2.00
Gem Hunters Guide	$3.95	Arizona Gem Trails	$2.00
Field Guide to Rocks & Minerals	$3.95	Gem Materials Data Book	$2.00

Treasure Map of the Great Mojave Desert. . . . $1.00



CATALOGS and CIRCULARS

Enclosed please find _____ Please rush my copies of the following:

- ☐ **CATALOG** #58-59. Approx. 175 pages of mountings, findings, equipment, supplies $1.00
- ☐ **CATALOG** #1960 . . . 75 pages of all new mountings and findings 50c
- ☐ **Circular** 1633 . . . 33 new styles of filigree mountings ..... FREE
- ☐ **Circular** #2460 . . . **DUR-A-LUX** mountings and findings ..... FREE

Refund Certificate in each catalog or BOTH catalogs free with $5.00 or more order from this ad.

GEODE INDUSTRIES

106 W. MAIN STREET NEW LONDON, IOWA

Situated in S.E. Iowa. The biggest little town in Iowa. Gateway to the land of Geodes.
Registered Trade Mark Applied for
COVINGTON LAPIDARY EQUIPMENT

SHOPPING for PRICE?

Immediate Delivery — Prepaid

Summer Special on POLISHED GEMSTONES*. Super Polish. Beautiful Stones.

Amethyst, Brazilian Green Quartz, Rose Quartz, Snow Quartz, Golden Tiger Eye, Red Jasper, Yellow Jasper, Agate, Petrified Wood.

ONLY $2.25 per pound*. Assorted Mixture only. 1 lb. Minimum order.

BELL CAPS* for Polished Gemstones

	doz.	½ gross	1 gross
No. 1 7 Point Gold or Rhodium Plate*	$0.20		$1.65
No. 2 7 Point Large Gold Plate*	.25	$1.15	2.10
7 Point Large Rhodium Plate*	.30	1.40	2.50
No. 6 4 Point Tiny Gold or Rhodium Plate*	.20	1.00	1.75

POPULAR BRACELETS* for Gemstones. Gold or Rhodium Plate*

No. 92 Hook & Eye for Dangles*	$0.20 each	$1.85 dozen
No. 98S Square Pad for Cementing (11 flat pads)*	.40 each, $2.20(6),	4.00 dozen

No. 250 EPOXY Adhesive—simple to use, solid as solder (Twice the usual amount for the same price.) 2½ oz. set $1.50

No. 260B POLYETHYLENE BAGS for Storage and Jewelry. Transparent. Durable.
3 x 4¼" .60 per hundred $2.40 for 500
No. 260 C/S 4 x 6" .80 per hundred $3.20 for 500

FREE CATALOG. All items marked * add Fed. 10% Tax. Calif. Residents also add 4% Sales Tax on all items. 25¢ handling charge orders less than $3.00. DEALERS WRITE.

JEWELGEMS by JAY O'DAY

P.O. Box 1000 E **1000 Palms, California**

MIDWEST INDIVIDUAL CLUB SHOWS

July 30. Rock-Swap Cooperative Dinner. The Mid-Iowa Rock Club and The Sac & Fox Lapidary Club will hold an all day **Rock-Swap and Co-operative Dinner.** Place: **Edmundson Park, Oskaloosa, Iowa** (on Co. Rd. 309; just off Hw. 137 at So. edge of Oskaloosa). Time: All day get-together but dinner at 12:30 p.m. (Bring enough food for self and family)—July 30. Attention: field trips to be arranged for July 29 afternoon if enough interest shown. (Mineral specimens and fossils). For information contact: Mrs. Mary Stitely, 1230 C. Ave. East, Oskaloosa, Iowa.

July 29 and 30 Field Trip. The Chicago Rocks & Minerals Society will hold Field Trips. Meet at: Ellison Bay, Wisconsin. Time: 10:00 AM July 29. Place: To be furnished all interested parties. Will collect: Coral Fossils. For details: Write Mrs. Dorothy S. Smith, 1904 Taft Ave., Berkeley, Ill.

Aug. 19 and 20 Field Trip. The Mesabi Rock & Mineral Club Inc. of Minn. will hold field trips. Will collect: **Host of Iron Country Minerals & Gems.** For details: Send stamp and inquiry to Richard Lake, P.O. Box 361, Dept. M.F.T., Chisholm, Minn. Information will be mailed about August 1, 1961.

Sept. 2, 3, 4. The Lincoln Gem & Mineral Club, Inc. of Lincoln, Nebr. will hold Field Trips West at: Ft. Robinson Inn, Ft. Robinson, Nebr. Leave promptly at 8:00 A.M., Sept. 2, send card notice and for information write to: Mrs. Maurice Tracy, Sec., Lincoln Gem & Mineral Club, 3601 South St., Lincoln, Nebr. For lodgings and meals contact: Mr. John G. Kurtz, Supt., Ft. Robinson State Park Facility, Crawford, Nebr.

Oct. 7-18. The Lincoln Gem & Mineral Club, Inc. of Lincoln, Nebr., will hold a Gem Show at the National Guard Armory, 1776 N. 10th St., Lincoln, Nebr. For complete information contact: Mrs. Maurice Tracy, Sec., Lincoln Gem & Mineral Club, 3601 South St., Lincoln, Nebr.

Notice to Advertisers

Our advertisers are respectfully advised that the advertising deadline for the next issue will be Aug. 10th for all NEW ADS. Deadline for REPEAT ADS and for NEW PLATES submitted will be Aug. 14th.

ADVERTISERS INDEX

CLASSIFIED ADVERTISING

Rate: Eight Cents per word, per issue. Minimum $2.00, payable in advance. No proofs or copies for checking are furnished. Introductory words will appear in CAPITALS. When additional capitalization is required, each such word counts as two words. No charge for name and address.

Gemstones, Lapidary

CRYSTALLIZED LODE GOLD NUGGETS in micromount vials $2.00. Placer gold nuggets from buried tertiary channel $2.00. Gold dust $1.00. Goldbearing black sand $1.00. Attractively displayed. Postpaid. Guaranteed. LESTER LEA, Box 942-E, Mt. Shasta, Calif.

DEALERS—NON-TARNISHING ALUMINUM CHAIN AND FINDINGS! Necklaces, bracelets, earwires, clasps, bola tips, mounts, bell-caps; all in permanently bright anodized aluminum. Choose from yellow or pink gold or silver color from the largest stock in the U.S. Send $1 for samples. Use letterhead or send tax number. Buy Direct from Prime Source. R. B. BERRY & COMPANY, 5040F Corby St., Omaha 4, Neb.

DIAMONDS: Thousands of fine crystals available. All sizes from small perfect crystals for micro-mounts to large perfect crystals for specimens and cutting. From 75c each to $20.00 per ct. LAPIDABRADE, INC. 2407 Darby Road, Havertown, Pa.

CUSTOM SILVER AND GOLD WORK: Have your stones set into lasting Jewelry. Handmade S/S Brooches, average size $3.95; S/S Pendants $3.75; Heavy Men's S/S Rings $5.00 up; Ladies' and Boys' Rings $4.00. Fancy S/S Bola Slides $4.00. Faceted Gems set in Gold. Lost stones replaced, etc. Send $1.00 for nice faceted Zircon and current listings, postpaid. DON JACKSON, Claypool, Arizona. Over 10 years Serving Gem Hobbyists.

IMPORTED GEM MATERIALS. Buy from your resident, reputable, and well established dealer: Selected tumbling cabochon, and choice faceting materials in the rough. Our specialty is still Australian Fire Opals. Also everything in cut stones such as Jade, Sapphires, Rubies, Emerals; also Synthetics, etc. Price list available, wholesale and retail. FRANCIS HOOVER, 12449 Chandler Blvd., North Hollywood, Calif.

PREFORMS. Choice, assorted, ring-size agates, 10 for $1.25; Brazilian 40 x 30 mm., 10 for $4.50; Brazilian 30 x 22 mm., 10 for $3.50. Brazilian slabs 10 sq. in. for $2.00. All 4 items postpaid $11.00. Assorted agate ring stones, 10 for $5.50, including 1 fiery special black opal. HUNTER & SONS, 4489 McKenzie Hwy, Springfield, Ore.

CRYSTALS, MINERALS, semi-precious stones; rough. Pocket size whetstones. Colorful Novaculite for cutting. Also, Rock jewelry. All Rock Hounds welcome. HOUSE OF CRYSTALS ROCK SHOP. R. #1, Box 624, Hot Springs, Ark. (12 mi. S. on Hwy. 7).

ALUMINUM NON - TARNISHING CHAIN by the foot. Make your own bracelets and necklaces. Send $1.00 for generous sample lengths of assorted styles, with catches. R. MYLES HERBER, Box 176, New York 8, N.Y.

Minerals, Petrified Wood

HARVEY R. SHULL, Rockhounds Paradise in NEW LOCATION and larger sales rooms in Oskaloosa, Iowa. I now have one of the most comprehensive stocks in the Midwest, after ten months gathering from many states and Old Mexico. If you are looking for beautiful, unusual specimens, you will surely find them here. Thousands of pounds of spectacular Fluorescing items, cutting material, huge and tiny crystals, Amethyst specimens, agatized, petrified wood; chunks, slabs, and bookends. Colorful onyx from several locations; hundreds of cut and polished Geodes, many filled with amethyst crystals. Hundreds of other items. Come have a look. Bring your fluorescent lamps; drive right in on the lot. Plenty safe off-street parking. HARVEY R. SHULL, North Market Street, U.S. Highway 63, RFD 1. See new sign one mile North of Post Office, Oskaloosa, Iowa.

TEN POUND PACK cutting agates or petrified wood $8.00 postpaid. 100 lbs. mixed tumbling size or (specify) cutting size. $40.00 freight paid. WALT'S ROCKS, Nyssa, Oregon.

ROCKY MOUNTAIN SERPENTINE. For gem cutting or carving. Order either hardness 4, 5, or 6. Colors near white to near black. All greens available. Flawless, dense, beautiful material. Stream pebbles and boulders. Some translucent. 5 pounds $6.00 PP. Send for listing to BASIN MINES, Box 172, Nelson, B.C., Canada.

GOETHITE CRYSTALS, Massive, Minnesota 50c to $5.00. Tumbled Wyoming mixture—Agate, Jasper, Wood—$4.00 lb. Custom-Slabbing—24' saw. Dealer "Rocks, "Frantom" Lapidary Equipment. Variety Rough, Slabs, Tumbled, Baroques. Also Grits, some Findings. Open after 4 P.M. Phone T.W. 4-4041. HAZETT STAMP SHOP, 620 N. Grant, Bay City, Michigan.

NATIONALLY KNOWN—Our stocks are large, choice, diversified, and reasonably priced. Retail and wholesale. SPECIAL, 5 lbs. of mixed cutting materials, POSTPAID $4.00. Request larger quotations. GOLD coins wanted. THE COLES', 551 S.W. Coast Hiway, Newport, Oregon.

BARITE ROSES. Choice $1.00. Amazing Sand-Calcite crystals 25c up. Minimum order 50c plus postage. Choice Thumbnail to cabinet sized clusters from $1.00. Orders over $1.00 postpaid. Complete line of Rockhound & Lapidary supplies including rough and slabs. Dearlers' inquiries invited. SOUTH BEND ROCK SHOP, 915 S. 32nd St., South Bend, Indiana.

SUMMER SPECIAL: Assortment of 20 inches plus of excellent slabbed material, Mexico and Texas agate, etc. $3.00 ppd. Ring eye slabs, $1.10. Free bonus. STAN'S ROCK SHOP, R. 2, on Centerville Rd., Carmi, Ill.

50¢ BRINGS YOU our beautiful catalog, 3 Sapphires and piece of Uranium. $1.00 for the above, plus "3 Arizona Rubies" and piece of sparkling Galena. WHITE MOUNTAIN MINERALS, Campton, New Hampshire.

WYOMING JADE, generous slab, $1.00. Choice: black, olive green, and phantom. Variety of tumbling material, 5 lbs., $1.00. Good cutting material: Oolite, wood, agate, jasper, algae, turritella, 25¢/lb. Medicine Bow agate, stalagtite formation with dendrites, also fluorescent, $1.00 per lb. Fossil fish, $1.50 to $5.00. Add postage. WITKA'S Hiway 30, West-end, Rock Springs, Wyoming.

COLORADO IGNEOUS ROCKS. Complete your Rock and Mineral Collection with eighteen geologists samples, classified, information, chart. All for two dollars postpaid. Satisfaction or refund. EDWARD OLER, 3017 Stuart Street, Denver 12, Colorado.

MINERAL SPECIMENS: Large variety —domestic and foreign. Mineralights, Microscopes, Pocket and Hand Lenses, Books, Geology Hammers, Gift Items. No lists. Specific inquiries gladly answered. Your inquiries invited. GLOBE MINERALS, 163-03 Depot Road, Flushing 58, New York.

HUMPHREY'S BEST BUYS. Select Valley Springs moss agate $1.50 lb. Death Valley dendritic jasper 75¢ lb. Calico rose agate 75c lb. Minimum order $5.00, check with order. HUMPHREY ROCKS GALORE, 1328 El Camino Real, Mountain View, Calif.

Fossils

TRILOBITES (Phacops), $1.00 and up. Fossil collection, 9 different specimens mounted on attractive card, each identified, $1.25. Ten different Brachiopods, $1.50. Gastropod and Pelecypod, 35c each Three different corals, 75c/set. DON H. WHITE, Box 181, Ottawa Lake, Michigan.

PENNSYLVANIAN AGE FOSSILS. Excellent preservation. Author, group, formation, and location index classification. 100 plus in 15 to 20 kinds packed in cellophane bags and postpaid, $5.00. Penn. imprints of plants, in massive hematite, 25¢ each; 3 different ones in the above 100. GUY QUINN, Box 190, Eastland, Texas.

FOSSILS: 15 classified $2, 15 Pennsylvanian $2.50; 15 Permian $2.50; 15 Ordovician $2.50; 15 Devonian $2.50; 50 classified $7.50. Mammal teeth, bones, plants; everything in fossils. Send postage. List. PIONEER MUSEUM, Burnet, Texas.

HELP!! me improve my fossil stock. I will trade fossils, stamps, and even money (!) for common and rare fossils. Write first, giving fossil identifications, quantity, quality, and state your own needs. MALICKS, 5514 Plymouth Road, Baltimore 14, Maryland.

Fossils (cont.)

ORDOVICIAN FOSSILS! Trilobites, Crinoids, Cephalopods, Brachiopods, Gastropods, Bryozoa. You name it, we have it. Send for your free price list. DENS' FOSSILS, 2326 Barton Blvd., Rockford, Illinois.

Equipment

MICROSCOPES: Large Stock. All makes. New, and Used Completely Rebuilt. Send 10c, Stamps or Coin, for listing. Refractive and heavy liquids, Specific Gravity Balances, Scientific Equipment. LAPIDABRADE, INC. 2407 Darby Road, Havertown, Pa.

SALT LAKE CITY, UTAH. Drop in when out this way. We have specialized in Equipment, Findings, Supplies, etc. for Rockhounds since 1950. You may pick up your Free copy of Utah locations, or send a stamped envelope. However, would rather be blessed with a visit. No catalog. KEN STEWART'S GEM SHOP, 136 West South Temple, (½ block west of Temple Square).

SPECTROSCOPE (results like a $30.00 instrument) and illustrated, cloth instruction book 220 pages for quick ore and mineral analysis. Both $7.00. SCIENCO, 875 Arastradero Rd., Palo Alto, Calif.

ULTRAVIOLET LAMPS, richly housed in aluminum or bakelite; assembled or kits from $10.50. America's most complete line of lamps, kits, filters, tubes, accessories. Free literature. RADIANT ULTRA VIOLET PRODUCTS, Cambria Heights 11, N.Y.

Exchange and Miscellaneous

WANT TO BUY: Mineral collections. Museum quality, domestic and foreign. Small collections and groups of excellent quality acceptable. No shipment prior to correspondence. Write complete details. GLOBE MINERALS, 163-03 Depot Road, Flushing 58, New York.

LARGEST COLLECTION. Slides of minerals and Geology Club programs with scripts. Send 4¢ stamp for rental list. Catalog of mineral or geology slides (state which), sample and 25¢ credit slip. Postpaid for 65¢. Come and use our equipment in our "Do-it-yourself" lapidary shop. Pay by the hour. ROCK HOUND SPECIAL, 8441E Bolsa Ave., Midway City, Calif.

FOR SALE: The Edward B. Thomas collection of Rocks, Minerals, Crystals. $5,000. Do not call except by appointment. Visitors welcome. E. B. THOMAS, 4 West Ave., Owego (Tioga County), New York.

CARBIDE LAMPS for Rockhounds. We have the few remaining original "Guys Dropper Carbide Lamps" in original cartons. A good conversation piece, an antique, or a darn good light. CAROLLO SALES, P.O. Box 168, Iron Mountain, Michigan.

MUSEUM DIRECTORY, "Mineral, Fossil, Rock Exhibits and where to see them." Lists information on nearly 200 public museums in U.S. and Canada with geological exhibits. Order from AMERICAN GEOLOGICAL INSTITUTE, 2101 Constitution Ave., Washington 25, D.C. $0.50.

ASSAYS. Complete, accurate, guaranteed. Highest quality spectrographic. $8. REED ENGINEERING, 620 S. Inglewood Ave., Inglewood 1, Calif.

TRY CARVING for fun and profit. Beautiful Colorado Alabaster can be carved with wood tools. We also have Snowy Range Marble in Pink, Red Salmon, and Mottled Gray. $1.00 per lb. We pay postage. DEL-GLO COMPANY, P. O. Box 930, Cheyenne, Wyo.

PACIFIC GEMCRAFT

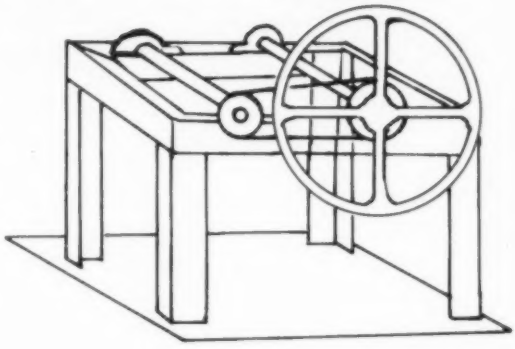
Presents

The Newest in Economical Tumbling:

THE PACIFIC TUMBLER

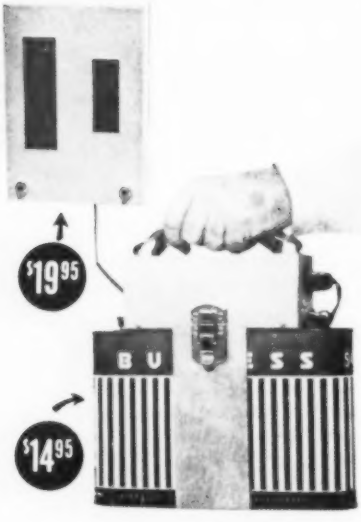
This sturdy tumbler comes ready for your motor and barrels. Two 5/8" rubber covered shafts ride in four self-aligning bearings, which will handle barrels 6" to 18" in diam. and 17" in length; or, up to 75 lbs. capacity.

$24.95 less motor & barrels. Dealer inquiries invited.



Also Distributors for

ULTRA-VIOLET PRODUCTS, INC.



with the new do-it-yourself kits:

Mineralight Gemini, both short and long wave in one $19.95

Power Pack Adapter—uses batteries to run Gemini or other lamps in the field $14.95

We handle a complete line of Victor Valley and other lapidary equipment. Plus supplies, findings, rough, slabbed, tumbled, and faceting materials. All prices f.o.b. Escondido, Calif.

Send orders and inquiries to:

PACIFIC GEMCRAFT

803 South Escondido Blvd., P.O. Box 1718, Escondido, California

Satisfaction always guaranteed